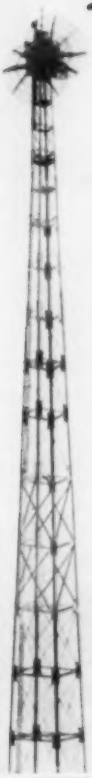
APR. 21 1961

# PETROLEUM WEEK

A McGRAW-HILL PUBLICATION



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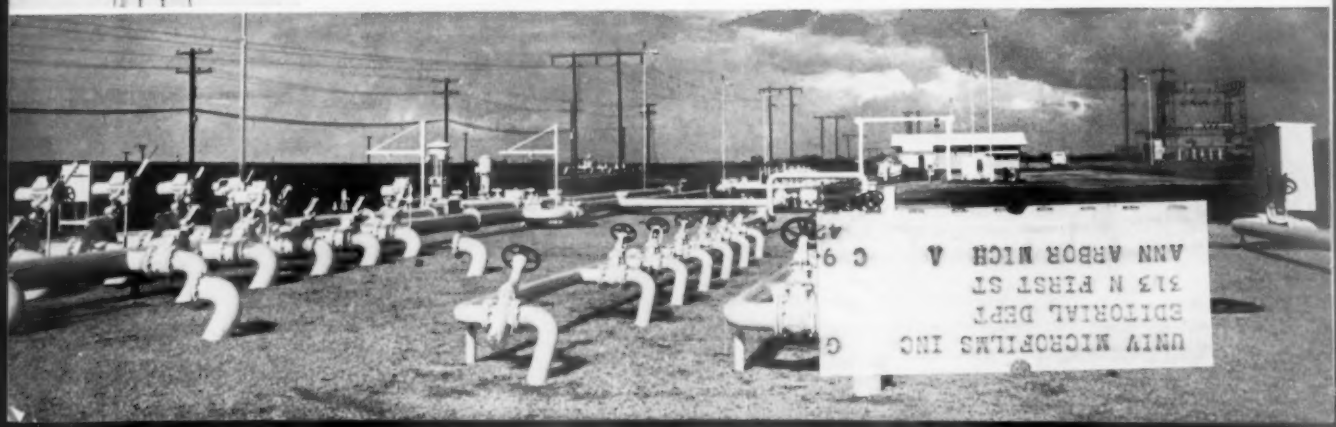

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**Seldom in the history of the oil industry has there been a tool as versatile as the one used in Abrasijet*.**

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Third, Abrasijet can be used in old wells completed in open hole to clean formation faces that have become plugged with various soluble and insoluble deposits. Since Abrasijet is mechanical in action, a detailed chemical analysis of the plugging deposit is not required.

Finally, there is a special money-saving application of Abrasijet. A tool with downward-pointing jets can use acid without sand to dissolve set cement in casing or tubing. In many cases this is safer and less costly than drilling out.

For detailed information on this versatile service—call Dowell. Dowell services and products are offered from more than 150 offices and stations in the United States, Canada, Venezuela, Argentina, Germany, France and the Sahara area. Dowell, Tulsa 1, Oklahoma. *DOWELL SERVICE MARK

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# "Go and look behind the ranges..." *Kipling*

The sun never sets on the oil seekers—the restless men whose rock hammers, seismographs and drill bits must find the oil the world wants. Growing demand for petroleum energy sends them roving the remote areas of the globe. Here two Sinclair geologists scout above the Arctic Circle in Alaska.

Last year Sinclair subsidiaries sought new oil and gas in many places. They found new fields in the U.S.A., Canada, and Colombia. They were encouraged in Somalia, hopeful in the Sahara. In 1960, despite import and other restrictions, Sinclair's liquid hydrocarbon output rose to the second highest point in history. Natural gas production set a record.

Petroleum continues to be our prime energy source. Through its oil seekers, *Sinclair is storing up reserves to meet the future's insatiable demand for energy.*

**AAPG—Sinclair salutes the American Association of Petroleum Geologists for furthering knowledge of the earth's history and its application to petroleum prospecting. Founded 44 years ago, the AAPG—through its 15,000 members—stimulates testing and standardization of geologic procedures and encourages education in its field, thus helping build essential energy reserves.**

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## INSIDE Slant

UP AND AT 'EM, BOYS

Fuel oil people have had a rough row to hoe, but they're finally making progress.

Probably the most encouraging sign is that gas distributors are sitting up and taking notice.

This came about at a recent meeting of gas management officials in Charleston, S.C. Said one speaker:

"Fuel oil is not only moving into a new phase of stepped-up developments in oil-heating equipment for new homes and remodeling . . . but it also is broadening its applications in homes.

"Some of these are oil-powered air conditioning, refrigerators, oil-heated swimming pools and outdoor movies, large area snow melting, and the future possibility of homes generating all their electric needs from home-fired generators."

The speaker, after poking holes in fuel oil's advertising claims, stressed that fuel oil dealers aren't the dullards and slowpokes they used to be.

They've sharpened up and are on the move, he said, and gas people will have to be on their toes from now on in.

Fuel oil dealers should be encouraged, now that the opposition is hurting — and showing it.

LeRoy Menzing
Editor

# '61 FORD SUPER DUTY TRUCKS

# BROADER WARRANTIES... GREATER DURABILITY... BIGGER CHOICE!

FORD DIVISION, Ford Motor Company,

- **New Super Duty V-8 Dealer Warranty—100,000 miles or 24 months!**
- **New extended Dealer Warranty for entire truck line—12 months or 12,000 miles!**
- **New stronger frames and huskier cabs for Conventional Cab models!**
- **Now 222 money-saving Tilts, Tandems and Conventionals with Super Duty V-8's to choose from!**

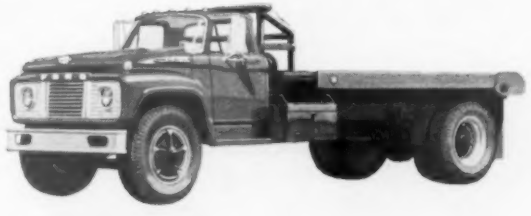
Ford's rigid quality control program gives you unsurpassed dependability! Positive evidence of uniformly high production and inspection standards is the exclusive new 100,000-mile engine warranty. On 401-, 477- and 534-cu. in. Super Duty V-8 engines, each major engine part (including block, heads, crankshaft, valves, pistons, rings), when engine is used in normal service, is warranted by your dealer against defects in material or workmanship for 100,000 miles or 24 months, whichever comes first. Warranty covers the full cost of replacement parts . . . full labor costs for the first year or 50,000 miles, sliding percentage scale thereafter.

In addition, an extended warranty covers all 1961 Ford Trucks of any size. Each part, except tires and tubes, is now warranted by your dealer against defects in material or workmanship for 12 months or 12,000 miles, whichever comes first. The warranty does not apply, of course, to normal maintenance service or to the replacement as normal maintenance of such items as filters, spark plugs and ignition points. No other truck gives you such protection for your investment; never before could you be so confident of long-range durability!

**Tandem Axle models** are available with tilt cabs. As with conventional tandems, aluminum walking beams, wheels, fuel tanks are offered to cut weight.

**Most popular Tilt Cabs** on the American road! 1961 models represent five years of improvements. Four series—up to 36,000-lb. GVW, 65,000-lb. GCW.

**New tougher tandems** offer greater strength in chassis, cab and sheet metal . . . new wide-track front end stability. Powered by rugged Super Duty V-8's, Ford tandems go up to 51,000-lb. GVW, 75,000-lb. GCW.



**New huskier conventional trucks** feature lighter, stronger frames of high-tensile steel . . . heavier gauge metal and stress-isolating independent mounting for radiator, fenders and cab.

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# FORD TRUCKS COST LESS

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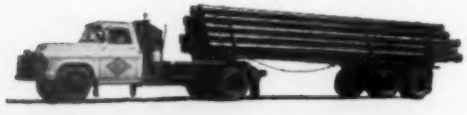
Joe Roughneck, heart of the oil and gas industry, likes the convenience and economy of having Lone Star's ultra-modern pipe mill right in the middle of his workshop. Lone Star maintains the largest mill stock of API casing and tubing in the entire oil country. Delivery can be made overnight to 75 per cent of the active areas. Lone Star's recently enlarged plant is, more than ever, Joe Roughneck's solid source of supply.

**Neighbor, wherever you are, specify Lone Star and we both get a good deal.**



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# Views That

## Missing the Boat

Dear Sir:

Somewhere along the line in her column "Who's Fooling Whom?" [PW—Mar.24'61,p17], Wanda M. Jablonski seems to be missing the boat and completely ignoring all of the testimony, data, and facts which led up to the present quota system.

May I refer you to a letter I wrote to your magazine in January, and which was published in "Views That Make News" [PW—Jan.27'61,p2]. In that letter, I attempted to bring out a few facets that your previous editorial had completely neglected, and again in this issue you continue to ignore the information available to you in the public record.

I particularly refer to the exchange and trading of domestic crude. For example: Our company has production in the Panhandle of Texas which is purchased by a major company. We exchange that crude which we produce in the Panhandle with this company for crude they have in southern Oklahoma, which Oklahoma crude is pipelined to our refinery. The major company in turn uses our crude at their Gulf Coast refinery.

When you made a statement that 76% of refiners who were assigned quotas did not use a single barrel of the crude you must agree that this is not the whole truth, since these refiners exchanged their foreign imports for crude that was available in their own areas, thereby in fact refining their foreign crude imports.

Exchanges of crude and products today are an integral part of the success of our oil industry and have provided means of disposition of crude which otherwise probably would not have been produced if exchange markets could not be obtained.

If you consider the entire situation from a security standpoint, inland refineries, whether they are large or small, certainly offer at least as much security to the nation as do coastal plants.

If you consider the situation from the standpoint of markets, if exclusively coastal refiners could buy or use cheap oil from foreign countries, and then ship it inland via pipeline and barge or exchange the gasoline resulting from the foreign crude refined at the coast (as they presently are doing) then they would be able to seize the entire inland market, forcing the inland refineries either to

# Make News

close down or to cut the price of crude in order to compete. The result would be to wreck the inland producer or eliminate the inland refiner. Either result would be disastrous for a healthy American oil industry.

This is not a "ring-around-the-rosy," but just a set of facts and conditions that exist in the oil business which makes it possible to supply oil for your typewriter, your automobile, your fishing boats, your factory, or whatever you may have.

M. LLOYD FREESE
*Vice-president*
*Bell Oil & Gas Co.*

## More Phantom Highways

Dear Sir:

If the author of the article, "Diversion Results: Phantom Highways" [PW—Mar.31'61,p14] were to do a little driving about West Virginia, he would conclude as well that that state must appropriate funds for highway projects very sparingly.

A. J. O'BRIEN
*Pittsburgh, Pa.*

## Salesmanship Is the Way

"There is one thing which some of us do not seem to realize and this is the fact that with so much oil and gas available in Western Canada the sale of those commodities is now a matter of direct competition with oil and gas outside of Canada. And in the long run, salesmanship in getting rid of the exportable surplus is preferable to government intervention and subsidies."

—THEODORE A. LINK
*President*
*Link, Downing, Cooke & Co.*
*Calgary*

## Supply & Demand

"The health of the industry, which is so closely interwoven with the health of our entire economy, demands that supply be geared to demand. The law of supply and demand is a natural law; it cannot be repealed."

—P. C. SPENCER
*Chairman*
*Sinclair Oil Corp.*

PETROLEUM WEEK *will publish reader comments each week. Address letters to LeRoy Menzing, Editor,* PETROLEUM WEEK, *330 W. 42nd St., New York 36, N. Y.*

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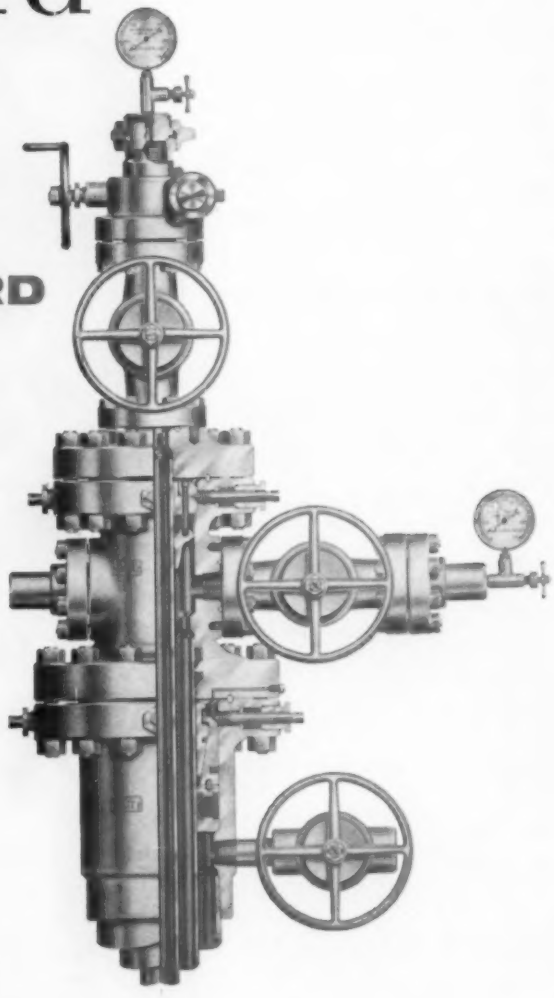
# The O·C·T Standard Tree



## STILL THE "STANDARD OF THE OILFIELD"

The O-C-T Standard Tree is a combination of an O-C-T casing head, O-C-T tubing head, master valve of your choice, and an O-C-T flow control.

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# 60-Second Summary

## THE WEEK'S MOST IMPORTANT DEVELOPMENTS

**PETROLEUM WEEK**

April 21, 1961

## For FASTER reading


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**It could be that the area pricing plan for natural gas will be scrapped.** Washington observers feel that the bogged-down hearings on Permian Basin prices might encourage a return to cost-of-service methods by a Kennedy-controlled Federal Power Commission. . . . p. 24

•

**Suboptimization, a relatively new term in management, is pinpointing the problem of unbalanced operations,** and could lead to tighter controls and better profit planning. . . . p. 60

•

**High tariffs are being discussed again as a possible solution to the imports problem.** But the feeling is that a tariff high enough to curb imports would hit Canada and Venezuela hard, unless they were given special consideration. . . . p. 17

•

**Nebraska's Sleepy Hollow area, despite its name, is now the most active area in the Rocky Mountain region.** Discovery of two producing horizons in the field last summer sparked the surge. . . . p. 26

•

**Automation is destined to play an increasingly large role in pipeline operations.** A Petroleum Week Special Report indicates that as much as 80% of this year's total expenditures may be invested in control instrumentation—to increase efficiency and decrease costs. . . . p. 44

•

**Humble Oil & Refining Co. is finally unlocking its huge reserves of natural gas.** Its sale of 6.2-trillion cu. ft. indicates it is moving into the interstate market as a major supplier after years of reluctance. . . . p. 18

•

**Secondary recovery methods are being talked about in the Fairway-Frankston area of East Texas.** Operators figure they can boost recovery considerably—even though the area isn't fully defined yet. . . . p. 28

•

**Ohio may be ready to lease offshore tracts in Lake Erie before long.** Leasing regulations have been approved and sent to interested parties for preliminary study. . . . p. 33

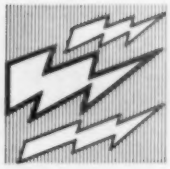
•

**Three potential oil fields are being developed at the southern end of the Persian Gulf,** an area which may soon become the Middle East's newest oil province. . . . p. 80

•

**Many small gas producers are fearful of President Kennedy's proposal to free them from Federal Power Commission controls.** They regard it as a "divide and conquer" move. . . . p. 20

# Up to the Minute



**SIGNIFICANT LATE NEWS**

**PETROLEUM WEEK**

April 21, 1961

**President Kennedy asked Congress this week for a new system of tax credits to stimulate capital investments on plant and equipment.** The credit system means a $1.7-billion tax cut to industry. The plan would mean a tax reduction of up to 30% on expenditures after Jan. 1, 1961, made up of these credits: 10% of the first $5,000 spent on new plant and equipment, without regard to depreciation; 6% on everything over 50% of depreciation allowance, but not over 100%; and 15% of spending in excess of total depreciation allowances.

**Kennedy also proposed a 2¢-a-gal. tax on jet fuels, and annual increases for all aviation fuels.** The initial tax on jet fuel would match the existing levy on avgas. He proposed annual increases of ½¢ a gal. on aviation fuels "until the portion of the cost of the airways properly allocable to civil aviation is substantially recovered." The President said the annual increase should be stepped up later, if conditions warrant. Former President Eisenhower had recommended a 4.5¢-per-gal. tax on both fuels.

**Elimination of tax advantages on income earned in "developed countries" overseas was another Kennedy proposal.** Among his recommendations: Taxation of income from foreign investment companies "in substantially the same way as income from domestic investment companies," and correction of tax laws to eliminate a "double allowance" for foreign income taxes.

•

**The initial crude allowable for Texas next month will average 2,636,562 b/d, a cut of 233,794 b/d from mid-April.** Production will be based on an eight-day schedule in May, one less than April, a move advocated by eight large purchasers. Three buyers—Mobil, Sun, and Atlantic—recommended nine days. Phillips Petroleum Co. asked for a seven-day schedule to reduce its "excessive" inventories of crude.

•

**The contract for sale of Honolulu Oil Corp. to Tidewater Oil Co. and Pan American Petroleum Corp. is expected to be signed next month.** Honolulu President L. A. Cranson told stockholders that the initial distribution would be around $90 a share.

•

**Early first-quarter earnings reports indicate a cheery outlook for oil companies.** Sun Oil Co.'s net for the first three months was "a trifle over $12-million, or about 33% ahead of last year." Commonwealth Oil Refining Co.'s first-quarter profits were $3,275,351, compared with a loss of $350,521 a year ago. Delhi-Taylor Oil Corp.'s earnings climbed 47% to $2.1-million, and Pure Oil Co.'s will be up "moderately."

•

**Tidewater Oil Co. cut its price for East Texas crude this week by 15¢ a bbl., to $3.10 a bbl.** The move affects 7,500 b/d, of which 5,000 b/d is produced by Tidewater. Sinclair Crude Oil Co. set the $3.10 posting a year ago. Atlantic Refining has paid $3.05 a bbl. in the field since July, 1959, while most buyers post $3.25 a bbl.

# WE HAVE DECREASED YOUR DRILLING COSTS

*and we can prove it*

Based on actual field information from major operators, we have effected substantial savings by the use of fine Milwhite engineered products in combination with applied mud technology. Let us discuss this with you.

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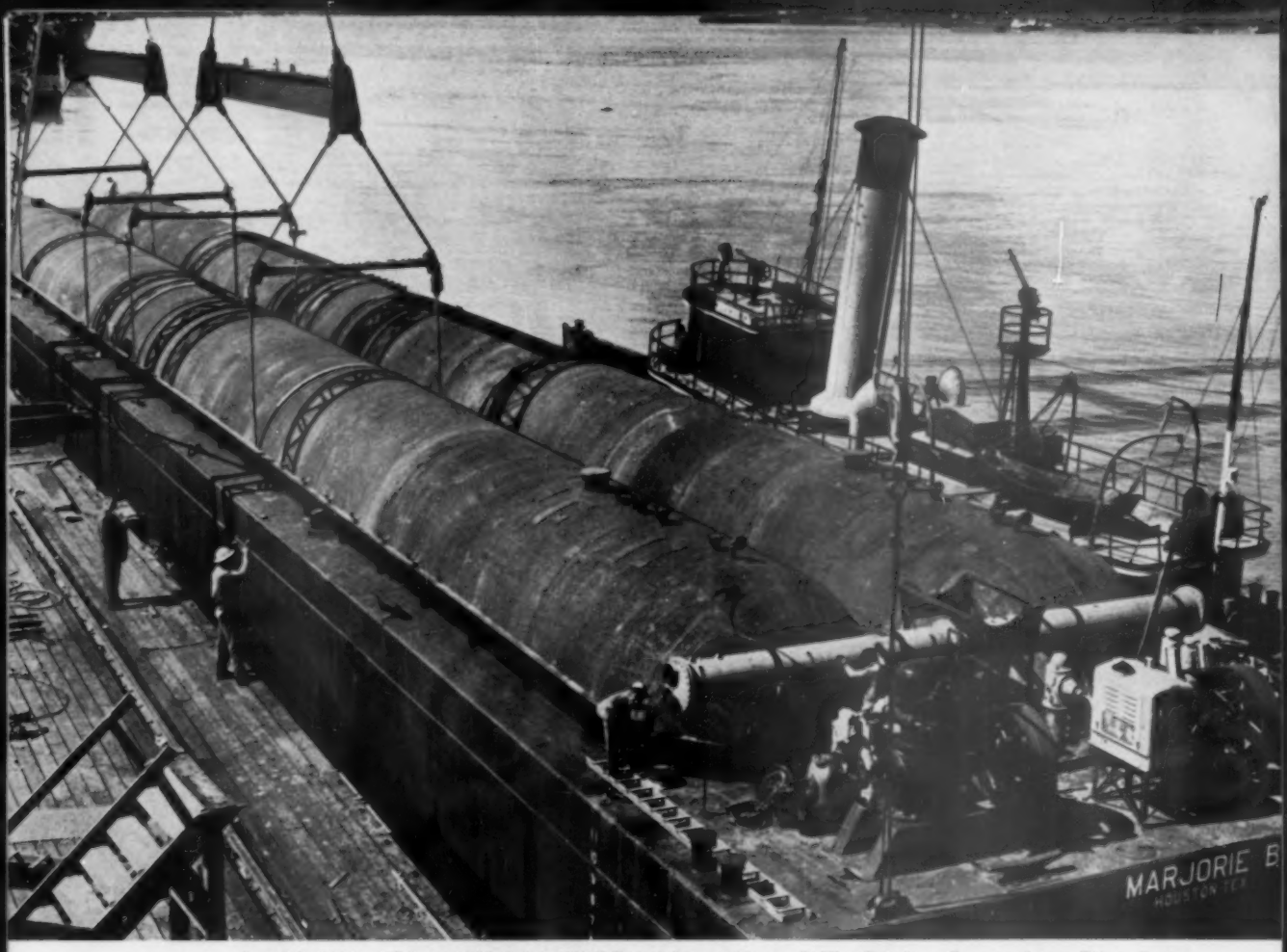
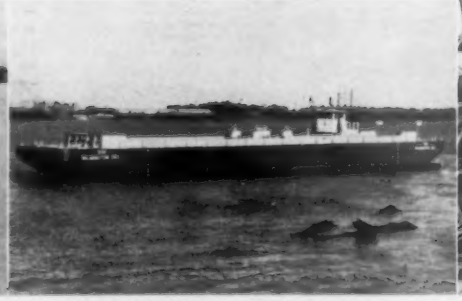



Avondale 600-ton lift lowers 242' O.A. by 16' O.D. tank into position on Phillips Petroleum Company barge. This unit, one of two refrigerated propane-ammonia barges building for Phillips Petroleum, are the largest tank carriers yet to be constructed for the chemical or petrochemical industry for this type service. The heavily insulated tanks will carry 1700 tons of anhydrous ammonia, refrigerated to minus 28 degrees F., by equipment installed on the barge.

# AVONDALE BARGES

## SUPER CARRIERS WITH A DIFFERENT MISSION

This liquid chlorine carrier was built by Avondale for Monsanto Chemical Co. and measures 195' x 35' x 11'. It contains six tanks, each 8'8" O.D. x 70'0" in length. The capacity of this barge loaded is 900 tons of liquid chlorine.



Liquid chlorine is being transported by this 175' x 26' x 11' cargo barge for the Diamond Alkali Company. Four independent tanks were mounted on saddles and retained by adjustable 3" x ⅛" flatbar straps.

Hull of Phillips Petroleum barge ready for launching at Main Yard. Hopper design accepts two saddle-mounted tanks. The lead barge measures 305' x 44' x 12'6", the trailing barge 284' x 44' x 12'6". The pair are designed to be handled either independently or as an integrated tow.

Spread on these pages you will see a portion of the ever-increasing Avondale-built barge fleet—*carriers with a different mission.* They're big, they're specialized—they're *super* carriers—custom-built for the chemical and petrochemical industries.

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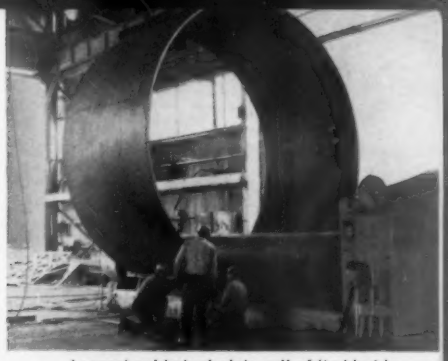
We would welcome the opportunity to quote *your* company in regard to its specialized barge requirements.

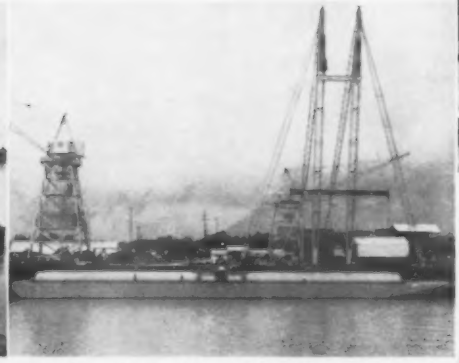


Largest cold steel plate roll of its kind in the Gulf South. This Bertsch roll in the Tank Shop has a capacity of 4½".

Specialized tank fabricating facilities. Foreground; tank nearing completion on aligning platten, left background; tank being stress relieved in Avondale 18' x 18' unlimited length stress-relieving furnace.

Tank and pressure vessel sections are welded together automatically on powered rolls in the Tank Shop.

In service for a chemical transporting company. Liquid caustic soda tank barge. Capacity 1682 tons. Size: 205' x 40' x 11'.



One of two independent pressure tank barges completed for Union Texas Natural Gas Corporation. Each barge measures 273' x 41' x 12'6". Each barge contains four cargo tanks 112' in length, each tank with a capacity of 165,000 gallons, for a total barge capacity of 660,000 gallons.

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# High Tariffs Might Be Effective

**Some oil men believe a switch to tariffs could provide more positive control of imports than present quotas. But the rates would have to be steep, and Canada and Venezuela would need preferential treatment on duties.**

**There is a growing belief in the industry that a high tariff may be the only ultimate solution for effective control of petroleum imports.**

Discussion of a possible switch to the tariff route from the present quota system most likely will be broached at next month's import hearings.

Several major companies have been advocating tariff control as the best solution. Among these are Sun Oil Co., which has plugged for tariffs instead of quotas as far back as 1956; Shell Oil Co., which recommended a tariff in 1959; and more recently, Texaco Inc., and Cities Service.

A tariff approach also has been proposed several times by independent producer organizations.

**Supporters of tariff to control oil imports have reached no agreement on how it should be applied.**

Generally, the various proposals involve a compensatory form of tariff under which a specified amount of imports would be allowed a nominal duty. Additional imports would be subject to a high tariff.

There have been at least three specific plans discussed.

One would permit imports up to a certain percent of domestic crude production to enter at the existent duties. Imports in excess of that amount would be subject to increasingly higher graduated tariffs.

Another proposal would allow importers to bring in up to 10% of their previous year's refinery runs at a minimum duty. Imports in excess of that level would be subject to a tariff of "at least $1 a bbl."

A third plan would permit the existing quotas to come in at the established duties with the remainder taxed at a sharply higher rate.

Compensatory-type tariffs would fail to provide effective control of imports, many observers believe. A company, they reason, could import twice the volume that would be permitted at the nominal duty, and by averaging the lower duty against a higher tariff would still be able to come out ahead on imported oil.

With a compensatory tariff of $1 a bbl., for example, the average tariff using the existing 10½¢ a bbl. maximum on crude would only amount to 55¼¢ a bbl., which is not considered to be high enough to discourage imports.

**A tariff on crude would have to be in the range of $1.25 to $1.50 a bbl. to provide effective control.**

That's figured on the basis of the present landed costs of Kuwait crude, which can be delivered to the East Coast for approximately $1.75 a bbl., ex duty.

A price of from $3 to $3.25 a bbl. for Kuwait crude on the East Coast would place it within the competitive price range of domestic crude.

Importers that would be subject to such a high tariff could possibly recoup a portion of the tariff paid in the form of a "drawback."

Present regulations permit any importer to receive a 99% drawback, or refund, on tariffs paid if those entered materials are exported.

A company for example, could export relatively high value specialty products, or chemical intermediates, refined from imported crude and possibly receive a substantial compensation in the form of drawbacks.

Identifiable exports of crude and products last year amounted to $429-million, compared with petroleum imports exceeding $1.5-billion.

Some of the high-value specialties that are now being exported by oil companies come under chemical classifications, rather than petroleum.

**Some proponents of a high tariff believe they could have a strong argument in their favor if they coupled their request with a proposal that the funds derived be used for highway building.**

The Kennedy Administration has proposed that Congress continue the 4¢-a-gal. gasoline tax and impose additional taxes on highway users to put the interstate highway system on a pay-as-you-go basis (PW—Mar.3'61, p10).

The President said that an additional $9.7-billion would have to go into the Highway Trust Fund if the

## Significant Sidelights

■ **In the 30 seconds or so that it takes to read these few lines, motorists will have paid $5,000 to $6,000 to federal and state governments in gasoline taxes.**

**And this goes on, night and day, week in and week out.**

**In fact, Empire Trust Co.'s computations show collection rates so astronomical that gasoline taxes in 1960 alone would have paid for enough motor fuel (excluding taxes) to run every car, truck, and bus in the nation for six months.**

**The New York bank's experts came up with this picture of 1960 collections—based on the U.S. average of 10¢ per gal.: every second, $182; every minute, $10,920; every hour, $655,200; every day, $15,724,800; and for the whole year, $5,740,000,000.**

**By way of contrast only nine oil companies in this country grossed as much as $1-billion in 1960.**

interstate system is to be completed on schedule in 1972.

Based on an allocated import level of 1.5-million b/d (slightly below the allocated volume of crude and products for the first half of 1961) and a flat tariff of $1.25 a bbl. for crude and products, the levy would generate $690-million annually.

By 1972, the target date for completing the 41,000-mi. interstate system, the accumulation from the tariff on petroleum imports would amount to at least $7.6-billion.

**Tariff supporters also believe that chances are improving in the highest Administration circles in Washington for protection-type levies as a move to aid business recovery.**

No decisions have been reached on such a critical issue, insiders say, but there have been strong arguments advanced to the Administration by some labor groups for higher tariffs for ailing industries.

A switch to a protectionist view of tariffs would represent a complete turnabout in Democratic party philosophy.

Some observers predict that the President would not hesitate to seek higher tariffs if they are considered necessary to boost the economy.

**Realists, on the other hand, see many obstacles, such as broad trade policies and delicate international relations, blocking a switch to tariffs to control petroleum imports.**

The greatest barrier to any sort of tariff system for restriction of imports is the general path of U.S. trade policy and the nation's relations with the oil-producing countries, particularly Middle East nations.

The Administration policy under both Eisenhower and Kennedy has been that trade policy and foreign aid are dovetailed necessities if underdeveloped nations are to improve their standards of living. From a strategic viewpoint, the thinking has been that foreign aid funds are useless to a nation that cannot export its commodities.

The role of tariffs as prohibitive devices has gone downhill since the first enactment of reciprocal trade legislation in the early '30's. Generally the trend has been toward tariff-cutting and the most-favored nation principle which gives a tariff reduction granted to one country to all others.

With some exceptions, U.S. policy has been not to limit the most favored nation treatment solely to members of the General Agreement on Tariffs & Trades, but to extend the privilege to all source countries.

There have been some inroads to that policy, however. The escape clause, giving relief to industries determined by the Tariff Commission to be injured by imports, has been made part of the Trade Act. Peril points have been established, beyond which imports are not allowed.

**Perhaps the most significant problem with a high tariff on oil would be the impact on Canada, Venezuela, and other Western Hemisphere nations.**

A tariff of $1.25 to $1.50 a bbl. would just about bring landed Middle East crude prices in line with domestic crudes. But such a rate on Canadian, and Venezuelan crudes would knock them out of the U.S. market.

Just a nominal increase in the duty on Canadian oil, oil men say, would price it well above U.S. crudes in the areas that Canadian oil now enters the U.S.

A tariff higher than $1 a bbl. on Venezuelan oil would place it at a competitive disadvantage with domestic crude at most refineries.

**Tariff experts generally agree, though, that the U.S. has the authority to establish varying tariffs to control the country-by-country flow of petroleum,** though some of the fine legal points may be subject to testing in the courts.

Either the President or Congress could take the initiative to establish tariff controls by country of origin.

The President could instruct the Trade Agreements Committee to describe imported oil in such a manner as to distinguish between Middle East, Canadian, or Venezuelan crudes. It could be done by distance from the U.S., by sulfur content, by depth of production, or the like.

Congress could pass legislation to accomplish the same purpose.

The distinction between light and heavy crude (25-gravity) that now exists in the tariff structure is cited as an example of what could be done to designate oils by source countries.

Crudes of 25-gravity and above now carry a duty of 10½¢ a bbl., while the lower gravities are taxed at 5¼¢ a bbl.

**Turning to tariff control of imports poses another problem for domestic producers—the rate finally selected.**

The President or Congress could agree that tariff control is better than quota regulation, but not necessarily go along with the argument that the tariff rate needed for Middle East oil would be as high as $1.25 a bbl.

The industry could, for example, end up with a maximum tariff of 75¢ or 90¢ a bbl., which would be ineffective in limiting imports.

## High Court Holds to Gas Price Ruling

**The U.S. Supreme Court this week stuck to its dictum in the CATC case, and said the Federal Power Commission must hold more hearings on two gas producer cases involving initial prices in southern Louisiana.**

The court refused to review cases concerning sales by 21 producers to Hope Natural Gas Co., and by California Co. and Superior Oil Co. of California to United Gas Pipe Line Co.

In upholding the U.S. Court of Appeals for the District of Columbia and the Ninth Circuit, the court maintained the pattern set by its 1959 CATC producer group decision, in which it ordered FPC to reduce initial prices if they appear too high.

The New York Public Service Commission and Philadelphia took the cases to the appeals courts.

An FPC hearing examiner's opinion is now being awaited in the original CATC case.

**NEXT WEEK** *Be Sure to Read:*

**SPENDING PLANS** reflect optimism . . .

**A spring check-up on the petroleum industry's capital and exploration spending plans shows that oil companies are still strongly optimistic for 1961 and the immediate future years. Substantial sums will be invested in more automatic equipment to improve efficiency—from the wellhead to the consumer.**

*The impact of import controls:*

# Resid Fuel Prices Decline in East

**East Coast prices of residual since mandatory import controls were instituted have averaged considerably less than in the two years prior to controls.**

That's the significance of an Office of Civil & Defense Mobilization report this week on its price surveillance of resid prices for the four-year period ended last year.

OCDM officials carefully refrained, however, from making any comments or conclusions that would inject the agency into a political controversy of whether prices were unduly high.

**Data on full tanker cargoes for resale showed that delivered prices on the East Coast averaged $2.08 a bbl. in 1960, up 3¢ a bbl. over 1959, but substantially below precontrol 1958 and 1957.**

Information supplied by companies for the four years covered full cargo deliveries for resale to terminal operators and others. The average price in 1958 was $2.27 a bbl. and for 1957, $2.92 a bbl.

Deliveries for resale accounted for 72% of total deliveries in 1960. Deliveries to electric utilities amounted to 24% of the cargoes. Less than 5% of the deliveries went to other buyers, primarily industrial accounts.

The deliveries included imported and domestic residual, and covered all allowances and charges.

Frank B. Ellis, director of OCDM, said that during the first 15 months after the mandatory import program was inaugurated in the spring of 1959, prices of resid for resale "mostly were either unchanged or lower than in the earlier period covered by the statistics."

East Coast residual prices, Ellis observed, "were lower in the first quarter of 1960 than in any other quarter in the entire four-year period." In the New England district, Ellis noted, "the average price in the first quarter of 1960 was 5¢ a bbl. below that of the quarter immediately preceding the imposition of import controls."

**Residual fuel sales to electric utilities averaged $2.14 a bbl. in 1960, slightly above 1959, but below 1958 and 1957.**

The price to power plants averaged $2.08 a bbl. in 1959, $2.30 in 1958, and $2.81 in 1957, OCDM reported.

The 1960 prices of resid to other industrial users averaged $2.45 a bbl. in 1960, compared with $2.32 in 1959, $2.42 in 1958, and $2.97 in 1957.

"Although the largest of all price increases [over 1959] appeared in this category," Ellis commented, "the small proportionate volume of sales in this group may make price increases less meaningful here than in sales for resale and sales to electric utilities."

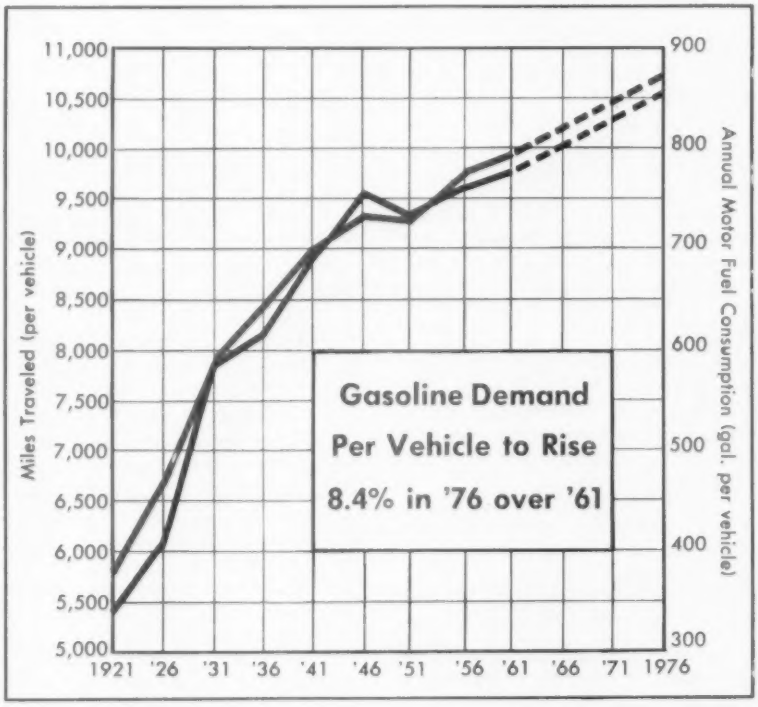
Starting with 1961, suppliers have to report monthly to OCDM on prices paid for partial tanker volumes, and for deliveries by barge, tank car, and trucks.

Residual prices, particularly in New England, have been an issue in congressional criticism of the over-all mandatory import control plan. Representatives from New England have charged frequently that the price of fuel was a factor in the depressed economy of some New England industries.

**Government officials still have made no detailed comment on distilled fuel oil prices on the East Coast,** a study directed by President Kennedy last February.

At that time OCDM said it was making its usual price surveillance study of light heating oil prices in the wake of criticism in government circles that suppliers had raised prices in mid-winter.

The advances in December, January, and early February were short-lived, however.




# Vehicles Will Travel More in '76

**Each motor vehicle in the U.S. will travel an extra 773 mi. annually by 1976, burning an estimated 66.6 gal. more gasoline than it does today.**

Forecasts by the Bureau of Public Roads show that annual mileage per vehicle can be expected to average 10,562 mi. 15 years from now, compared with the 9,789 mi. anticipated for 1961.

The bureau expects average annual gasoline consumption per vehicle to increase from 788.2 gal. to 854.8 gal. over the same period.

**The 1976 estimate is for approximately one motor vehicle for every two persons** in the total population, and three vehicles for every four persons in the driver age group, the bureau estimates.

# Humble Makes Largest In-Place Sale

**Humble Oil & Refining Co.'s billion-dollar sale of 6.2-trillion cu. ft. of natural gas to Columbia Gas Systems, Inc., indicates it is moving into the interstate gas market as a major supplier, at long last.**

Heretofore, Humble has been one of the most reluctant of the large producers to sell gas interstate.

As a result, it probably has the greatest reserves of undedicated gas of any company.

Its transactions, prior to this one, have been small in comparison to its reserves. And for the most part, they have been relatively short-term.

This then represents a major move by the Texas-based firm, and presumably reflects a changed attitude in management thinking and planning.

**The fact that Humble also set up a new division to handle nationwide sales of natural gas tends to confirm the prime supplier angle.**

This was revealed last weekend—three days after the 6.2-trillion-cu.-ft. sale was unveiled.

The newly formed division is headed by W. J. Greenwald, as general manager, and John J. Carter, as division manager.

Assisting them will be three coordinators: W. D. Moore, economics and planning; W. E. Curry, Jr., negotiating and marketing; and J. R. Suman, Jr., supply and Federal Power Commission.

**Humble's reserves of natural gas are enormous**—somewhere in the neighborhood of 26-trillion cu. ft. or more, based on a prospectus issued by its parent, Standard Oil Co. (N.J.) in the fall of 1959.

Phillips Petroleum Co., whose sales of 2.8-billion cu. ft. a year make it the largest seller in the country, ranks next to Humble in proved reserves. But, unlike Humble, Phillips' gas is largely dedicated already.

**The Humble deal undoubtedly is the largest transaction of its kind in the industry to date.**

It's an in-place commitment, involving sale of the reserves rather than a contract for production. This type of sale is comparatively new in the gas business, and is intriguing producers and federal regulators alike (PW—Apr.7'61,p13).

The prime commitment is for 3.5-trillion cu. ft., and a secondary agreement covers 2.7-trillion cu. ft. more.

Humble would not comment on the amount of money involved in the transaction. A previous in-place sale in Louisiana saw gas sold at 13.4¢ per Mcf. to 15.9¢ per Mcf. however. If the Humble gas went for, say, 15¢, that would make it a billion-dollar-plus transaction. If it went for as little as 10¢ per Mcf., it would be in excess of $600-million.

**A 30-IN. PIPELINE will be constructed from Houston to Alexandria, La., to connect Humble's King Ranch gas plant with Columbia Gas System's network.**

**To make the transaction possible, Humble is joining in the formation of a new interstate pipeline company, Monterey Gas Transmission Co.**

Monterey will acquire Humble's reserves and will in turn sell gas on a contract basis to a Columbia Gas System affiliate.

The initial shareholders of Monterey are Humble and Lehman Bros., a New York investment firm. After Monterey obtains a certificate of public convenience and necessity from the Federal Power Commission, it is contemplated that financing will be obtained by institutional loans and a public offering of securities.

This, of course, will require approval of Securities & Exchange Commission.

John R. McMillan, former executive vice-president of Monterey Oil Co., which Humble acquired several months ago for $69-million, will be president of the new pipeline company. Donlin P. Murdy, former vice-president and treasurer. Directors will include McMillan, Murdy, H. W. Haight, executive president of Humble, and Frederick L. Ehrman, a Lehman partner.

**Monterey's intent is to acquire Humble's 30-in. transmission line from its King Ranch gas plant to Houston, and to construct another 30-in. line from Houston to Alexandria, La., to link up with a Columbia subsidiary.**

Humble's line from King Ranch, in Southwest Texas, to its Clear Lake gas plant, near Houston, is 238 mi. long. The next line will run 216 mi. from Clear Lake to the tie-in with Columbia Gulf Transmission Co., which will transport the gas to Columbia's consuming area.

Present plans envisage the movement of more than 700-million cu. ft. a day to United Fuel Gas Co., principal supplier of gas to other Columbia Gas System companies.

Deliveries under the contract with United Fuel will run until 1986 or later, and will be on a cost-of-service basis under which the field cost of gas

is fixed for the term of the contract on the basis of Monterey's investment in purchasing the reserves.

Deliveries are scheduled to start late next year—presuming that all essential approvals are obtained without undue delay.

The gas ultimately will be distributed to consumers in Ohio, Pennsylvania, West Virginia, Virginia, Kentucky, New York, Maryland, the District of Columbia.

George S. Young, chairman of Columbia Gas System, hailed the pact as one that "will tend to level off the upward trend of prices which we have been experiencing."

**Humble officials say the Columbia transaction will have no bearing on its pending project to supply gas to the trans-Mexico pipeline to California.**

Humble officials noted that the proposed California sale, with Southern California Edison Co. as the purchaser, involves only 1.9-trillion cu. ft., over a 20-year period.

Its reserves are abundant enough to handle both commitments without trouble, and still have plenty left over.

**Meanwhile, Washington observers indicated that any controversy in Humble's arrangement with Columbia will boil down eventually to the price the latter pays for the gas.**

The fact that Columbia will take the gas from Monterey on a cost-of-service basis means that the cost of operating the new pipeline, plus the cost of the gas reserves, plus the rate of return, will be added up to reach the price Columbia will pay.

Columbia, like Monterey, will have to have FPC permission to construct and expand facilities to handle the gas flow. Columbia intends to boost its capacity from 75-million cf/d to 100-million cf/d.

**It seems certain that the Federal Power Commission will eventually have to review the price paid to Humble, even though an in-place sale of gas is involved.**

This is based on the feeling by FPC that in-place sales should be looked at more closely. And the staff already has indicated that it is going to do that.

It must be remembered too that the U.S. Supreme Court, in its CATC decision told FPC that it must look at initial prices. And with in-place sales coming along rapidly the price of gas isn't likely to be ignored by FPC.

**An important distinction between Humble's deal and other recent in-place sales is that Humble is retaining control of the reserves whereas the others did not.**

Texas Eastern Transmission Corp. pioneered the in-place transactions, but Tennessee Gas Transmission Co. brought them into prominence with three transactions aggregating 2-trillion cu. ft. (PW—Apr.7'61,p13).

Washington observers noted that Humble's hold on the reserves is being maintained through its interest in the third party, Monterey.

# Navy Will Test Fuel Cell Power

**The Navy will turn to fuel cells as an alternate to nuclear power for submarine propulsion.**

It will convert a conventional diesel-powered sub to a fuel-cell propulsion unit within two years.

A land-based prototype will be built in the coming year. Long range, the Navy envisions building several small attack submarines powered by fuel cells, if present experiments prove successful.

**The fuel cell potentially offers the Navy many advantages: It's cheaper and quieter than nuclear power, and it extends underwater endurance considerably.**

A fuel-cell-powered submarine can stay under water several weeks compared to the two- or three-day limit on conventionally powered submarines. The cruising range would be cut, but the Navy says the cruising radius will be sufficient.

**For some time, the Navy has wanted to build a fleet of small, special-purpose attack submarines approximately one-third to one-half the size of the nuclear-powered vessels.**

The size and cost of nuclear power plants, however, has prevented this. Fuel-cell-powered submarines may be the answer, the Navy says.

The Navy still has many questions to decide before building any of the new submarines. Best guess is that it will be three to four years before all final decisions are made.

The Navy still doesn't know if the fuel cells should power the submarines only below the surface or at all times. Fuel experimentation is still being done, too.

A mixture of oxygen and sodium or hydrogen can be burned in the cells to obtain roughly an 80% efficiency ratio, compared to roughly 40% for conventional (diesel and battery) or nuclear-powered submarines.

The Navy plans later to experiment with conventional fuels for fuel cells, such as diesel fuel and gasoline.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# Producers Fear Gas 'Freedom' Plan

## Industry sees President's offer to free small producers as a "divide and conquer" move, which would kill all chances of hoped for natural gas legislation.

**With President Kennedy behind them, backers of legislation to free small gas producers from Federal Power Commission controls are driving hard for congressional action this year.**

Reps. Torbert H. MacDonald (D., Mass.)—a friend of Kennedy's—John E. Moss (D., Calif.), and John D. Dingell (D., Mich.) worked for a Kennedy endorsement of small producer decontrol.

When Kennedy last week focused attention on FPC's huge backlog in his regulatory agency message, and made decontrol one of his own remedies for solving it, the three congressmen resolved to push for prompt hearings.

**There is strong opposition to such a step from many producers, large and small, who view it as a "divide and conquer" approach.**

The Congressional supporters know that Rep. Oren Harris (D., Ark.), who favors decontrol of all producers, has power over what bills are considered by his House Commerce Committee.

But they believe that with Kennedy behind them, their chances of getting hearings are good, and that once on the floor of either the House or Senate, the bill will have popular appeal.

**Kennedy described the FPC situation as "crucial" and "incredible" last week and offered a five-point package of changes to speed up regulatory procedures.**

The President asked for legislation that would:

- Permit FPC to exempt all small producers with annual interstate sales of 2-billion cu. ft. or less.
- Permit FPC to free pipelines from permit procedures when they want to expand, enlarge, or replace facilities to serve their authorized customers.
- Raise FPC from five to seven members.
- Authorize FPC to follow up portions of rate increases it disallows to be sure the funds get back to consumers, and require that rate increases being collected, but not approved, be put in escrow.
- Make the service of FPC chairman at the pleasure of the President, and make him responsible to the President for efficient management of the agency.

**Most of the President's proposals met a mixed reaction from industry spokesmen. While there is hope that FPC operations will be improved, there was some skepticism that Kennedy had picked effective means to achieve it.**

Small producer decontrol drew the heaviest fire.

Enactment of it, one producer representative said, will further bury hopes for decontrol of all gas production.

He predicted that it would encourage splitting up production among a multitude of tiny producers, and suggested that some majors might try to divide their operations among companies with less than the 2-billion-cu.-ft. limit.

A spokesman for a leading producer organization said the feeling among small producers varies.

Some, he said, will jump at the chance to be free of costly, time-consuming federal regulation, but others will fear that tight regulation of the big companies will result, forcing their own prices down.

"The small producers have their own problems," he said, "and many think these should be considered when gas prices are set."

**There is a distinction between decontrol backed by Kennedy and that envisioned by some congressmen.**

Kennedy believes that FPC should merely be authorized to free small producers, while his three Congressional supporters propose freeing them outright by legislative order.

**Pipeline company officials doubt that freedom to add facilities for existing customers without permits as Kennedy proposed would accomplish much to clear the $850-million backlog of pending certificate cases.**

Practically every addition of facilities of any size includes questions, such as reserve figures, that require hearings, and few pipelines have clear-cut service areas that don't overlap with other pipelines, one executive says.

He adds that uncontested applications are fairly promptly processed anyway.

Pipeliners challenge the contention that they misuse rate increases they collect subject to refund.

Portions of these increases they are eventually forced to return must be repaid with 7% interest, while capital financing can be undertaken for closer to 4%, a pipeline expert says.

**Kennedy's idea of increasing the number of FPC members has been well received.**

With the conclusion of Commissioner Arthur Kline's term in June, this increase would mean three new commissioners, in addition to the two who have already been named, Joseph C. Swidler and Howard Morgan, both Democrats.

If Kennedy replaces Kline, a Republican, with a Democrat, one of the two additional members would have to be either a Republican or a political independent, to comply with the rule ensuring bipartisanship.

Producers hope that of the three new members, at least one would be from the Southwest, familiar with oil and gas—particularly since Swidler and Morgan have no experience with gas regulation.

**Kennedy stated that "both the President and the Congress" share responsibility for the regulatory agencies, but he made no specific proposals likely to conflict sharply with the view among congressmen that the agencies are their "creatures."**

For instance, the controversial suggestion of his advisor, James M. Landis, that policies of the various agencies concerned with fuels should have White House-directed coordination, was ignored in Kennedy's message to Congress.

Also dropped was Landis' idea of a permanent administration overseer for all the agencies, a suggestion that infuriated some congressmen.

Landis now says that he will try to encourage coordination by trying to get agency and department officials together to discuss matters of mutual interest.

**The President's general recommendations for all the administrative agencies point to a general tightening, and fixing of responsibility.**

Each chairman would be accountable to the President for the operation of his agency, to avoid dilution of authority among a number of commissioners.

Hearing examiners would be paid better, and their decisions would have more importance, subject only to limited review by the commissioners where policy questions were concerned.

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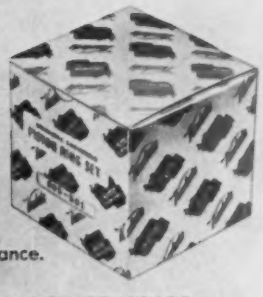

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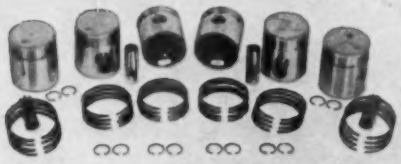

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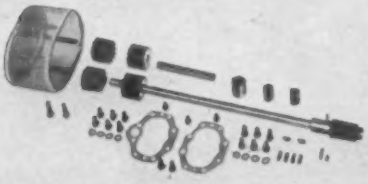

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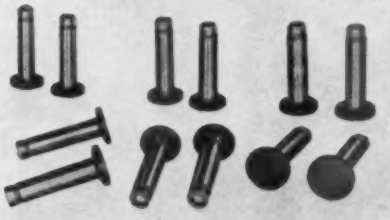

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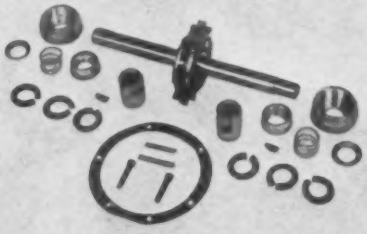

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> —*John Ruskin*

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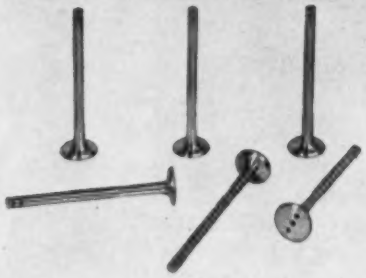

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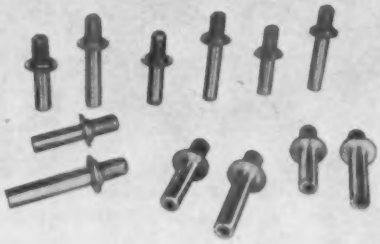

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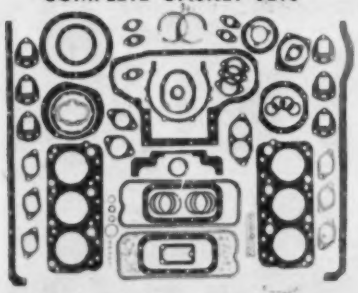

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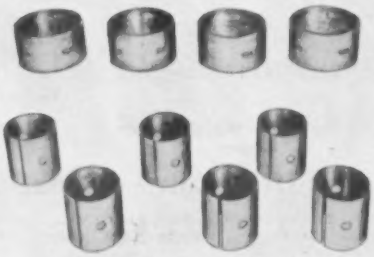

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United Gas Pipeline Bridge across Red River in Louisiana, two 24" pipelines, main span 1600' and side spans 800'

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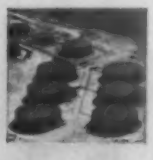

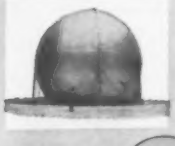

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# What's New IN THE INDUSTRY

**Phillips Petroleum Co., a newcomer, and Pan American International Oil Co., won new concessions in Libya last week** as the Petroleum Commission awarded acreage previously relinquished by other oil companies (PW—Mar.24'61,p44). Each company was awarded three tracts.

The Libyan affiliate of the Italian state-owned ENI group also applied for the acreage. But the commission refused to consider ENI's offer ruling it was not eligible to bid.

This marks the first time that Phillips has won a concession in Libya. Pan Am, an Indiana Standard affiliate, already holds acreage in the country. The Phillips grants total 3,972 sq. mi.; Pan Am's, 3,227 sq. mi.

•

**The Texas Independent Producers & Royalty Owners Assn. won't back legislation at the present time to require at least a ⅓ well factor in small tract allocation formulas.** In a statement defining the "precise position" of TIPRO on the Normanna case, John G. Hurd, president, pointed out that the effect of the Texas Supreme Court ruling in that case "will depend upon the action" of the Texas Railroad Commission. He added that the commission "retains the power" to enforce equity between small and large tract owners. If, he said, the commission actions tend to "repeal the law of capture," then "corrective legislation could be submitted with sound reasons for quick passage."

TIPRO has also gone on record as opposing a proposed law to establish minimum calendar-day oil allowables in Texas.

•

**Standard Oil Co. of California increased prices for Kenai Peninsula (Alaska) crude 20¢ a bbl. last week following a 20¢ cut in the pipeline tariff.** The new price for 40-40.9-gravity crude is $2.96 a bbl.

The company said the boost will substantially increase royalty income in Alaska this year.

•

**New Mexico's crude allowable for May has been set at 34 b/d in southeastern fields, down 1 b/d from April.** The allowable for northwestern fields remains at 70 b/d.

**Texas will start refunding approximately $13,850,000 collected under its natural gas "severance beneficiary" tax, which courts have held unconstitutional.**

Two of the largest refunds will go to El Paso Natural Gas, $1,598,776, and Tennessee Gas Transmission Co., $1,596,775. In all, 108 pipeline, oil, chemical, electric power, and other companies will get back tax money that they paid under protest since September, 1959.

Three state courts held the tax to be invalid. Atty. Gen. Will Wilson decided an appeal to the U.S. Supreme Court would be futile.

•

**Tennessee Gas Transmission Co. wants to build $1,320,000 worth of gathering facilities in the Gulf of Mexico.** The company has filed an application with the Federal Power Commission for an 11.8-mi., 12¾-in. gathering line from East Cameron (La.) Block 64, to West Cameron Block 180.

•

**The natural gas committee of the West Central Texas Oil & Gas Assn. is working on two possibilities to improve the gas market in its area.**

The committee is studying a proposal for ownership grouping of several gasoline plants and associated gathering systems in the gas trend from Young County to Coleman County. The idea is to connect these existing systems and use the over-all system as a base from which to expand, gather, and deliver gas to a central point. The committee is also working with Bend Arch Gas Co. and Texas Central Gas Co. to obtain a new pipeline in the area.

The committee said that "moderateness" of reserves and their widely scattered locations are proving handicaps in the drive for market outlets.

•

**Transwestern Gas Pipeline Co. is now in "serious negotiation" to sell substantial quantities of gas in markets outside of California.** In addition, the company says it is continuing to investigate new projects in both the field of regulated and unregulated activities. Company officials decline to elaborate, but there are industry reports that a move is being contemplated in the Midwest, and that the firm had been "approached" by eastern interests.

# Looking Ahead in Washington

**PETROLEUM WEEK**

April 21, 1961

**There's a growing belief that a Kennedy-controlled Federal Power Commission will quickly scrap area pricing of natural gas.** When Kennedy appointees gain control of FPC this summer, observers predict, nothing will encourage them to revert to traditional cost-of-service methods for producers' prices faster than the presently bogged-down hearings on Permian Basin gas prices.

**Some Washington sources are now convinced that there are both distributors and large producers who want this to occur.** They argue that many distributors are wedded to the cost-of-service approach because it can be strictly applied to cut producers' prices. And, these observers say, some large producers now believe they would do better with cost-of-service regulation at the wellhead than with area pricing, recognizing that no cost-of-service price determination for an individual company has ever resulted in prices lower than contract prices.

•

**Imports Administrator Lawrence J. O'Connor, Jr., is considered the top choice for the coming FPC vacancy.** Nothing has firmed up, but pressure is strong for an appointee from the Southwest to replace Arthur Kline, a Republican, when his term expires in June.

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**The question was being asked this week if FPC's area-pricing scheme is being purposely sabotaged?** It comes in wake of the collapse of the off-the-record prehearing conference on Permian Basin prices. The conference broke down over the key type of evidence it was called to discuss —costs. It will reconvene in Washington Apr. 27 to record the progress it made in closed session, but unless something is worked out privately, there won't be much to record.

The stalemate came when producers refused to give their cost data to Stanley S. Porter of Arthur Young & Co. to compile unless intervenors, led by those from California, agree to accept Porter's results without trying to force him to divulge individual company figures.

**Producers charged distributors with trying to wreck area-pricing, and distributors said producers were deliberately stalling.** In either case, the most controversial and complex type of evidence in the pioneer effort to set area-prices will be produced on a company-by-company basis, rather than industry-wide, endlessly prolonging and confusing the proposed formal hearings.

•

**Interior Dept. officials may ask the Senate to lift fund restrictions put on the helium conservation program by the House.** Interior asked authority to make commitments in fiscal 1962 to buy up to $60-million worth of helium in future years. The House Appropriations Committee cut this to $35-million in contracting authority. Interior officials were disturbed that the House questioned their ability to get the program moving as fast as they claimed.

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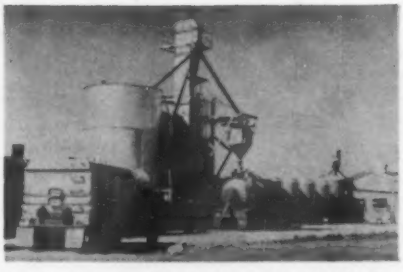

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# Nebraska's Sleepy Hollow Tops Rockies

**Nebraska's Sleepy Hollow area in Red Willow County has, almost overnight, become the Rocky Mountain's busiest drilling area. Right now 48 tests are staked, being drilled, or in process of completion.**

The total is at least ten more than in the Basin-Dakota area of northern New Mexico, believed to be the region's second most active area of current development.

Sleepy Hollow lies in the central part of the eastern portion of the county, in Nebraska's Cambridge Arch area. The south end of the field is 4 mi. east of the north end of Ackman pool, and 2 mi. north and west of Silver Creek pool.

Several dry holes have been drilled between Ackman and Sleepy Hollow, but the area between Sleepy Hollow and Silver Creek is undrilled.

**The significant fact of the Sleepy Hollow activity is that the pool opener was completed only nine months ago.**

Murfin Drilling Co. No. 1 Barth, section 25-3n-27w, was completed in early July, 1960, for 144 b/d of oil on the pump through perforations at 3,418-25 ft. in the Reagan. This was the first Cambrian production in western Nebraska.

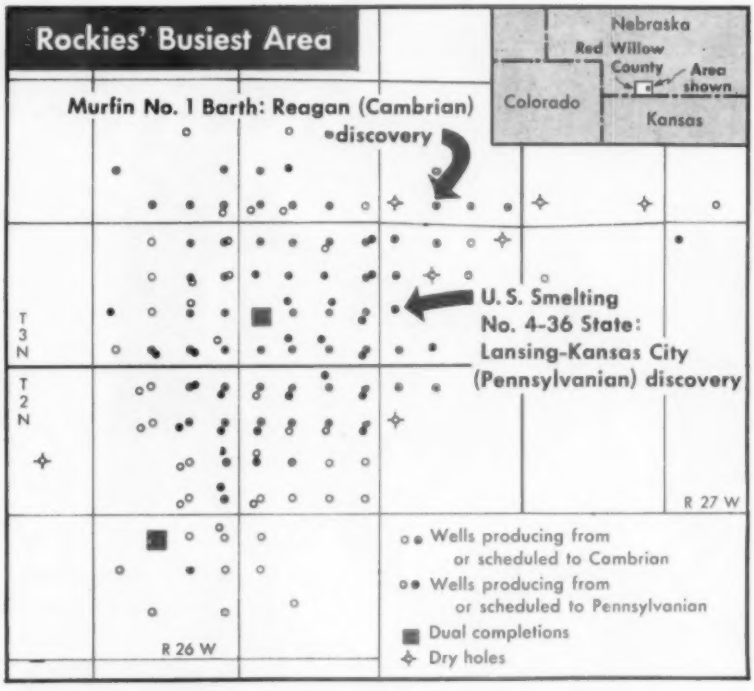
Midwest Oil Corp. generated further interest by its confirmation, No. 1-A Fritz, section 35-3n-27w, which recovered 450 ft. of oil on drillstem test of the Lansing-Kansas City (Pennsylvanian). Completion, however, was in the Reagan.

It wasn't until the end of August, however, that the potential of the area took an upswing with completion of a second Cambrian well. Franco-Central Oil Co. No. 1 Fritz, section 1-2n-27w, was drilled 1¼ mi. south of the Murfin discovery.

**Development of the area began in earnest last November.**

U.S. Smelting, Refining & Mining Co. No. 4-36 State, section 36-3n-27w, was completed for 145 b/d of oil on the pump through perforations at 3,262-78 ft., in the Lansing-Kansas City, some 200 ft. above the field's deeper producers. This was the first completion in this formation in the field.

Within a few weeks, Pubco Petroleum Corp. staked 14 locations in the area and Ohio Oil Co. scheduled four. Midwest Oil followed with another series of locations. Since then, Pubco and Midwest have been the most active operators in the area—Pubco having completed 23 oil wells and Midwest 31. At last report, Pubco was testing 13 holes, was drilling seven more, and had nine staked. Midwest was testing eight, was drilling three, and had two staked.




**There are now more than 90 wells in the field, most of them producing from the Reagan (Cambrian) or Lansing-Kansas City (Pennsylvanian).**

As of late March, there were 52 wells producing from the Cambrian and 33 from the Pennsylvanian. There were 13 Cambrian holes being tested, another five were being drilled, and 12 were staked.

At the same time, 33 Pennsylvanian wells were completed, three of them in deeper Pennsylvanian zones, variously identified as Cherokee, Marmaton, and basal sand. There were ten Pennsylvanian holes being tested, five being drilled, and two staked.

**Possible extent of the field has not yet been indicated by drilling to date. At last check, Sleepy Hollow extended slightly more than 3 mi. north to south, and nearly 3 mi. east to west.**

Midwest abandoned one hole on the northwest side of the field, a west offset to the pool opener. Subsequent drilling however, has extended production to the west and north.

A dry hole by Franco-Central may indicate limits on the southwest flank of the area, and failures by Skelly Oil Co., Murfin, and U.S. Smelting apparently have defined producing limits along its northeast side.

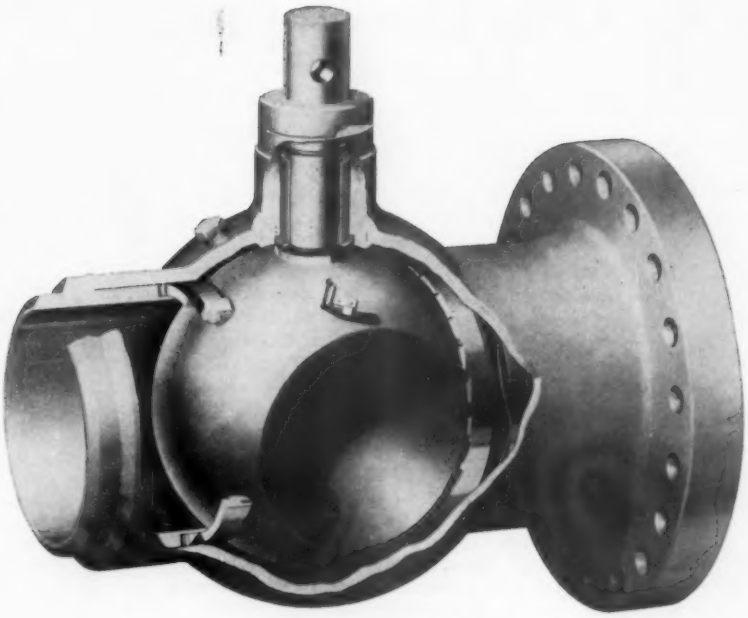
Additional failures have been drilled west of the south end of the pool, between Sleepy Hollow and Ackman.

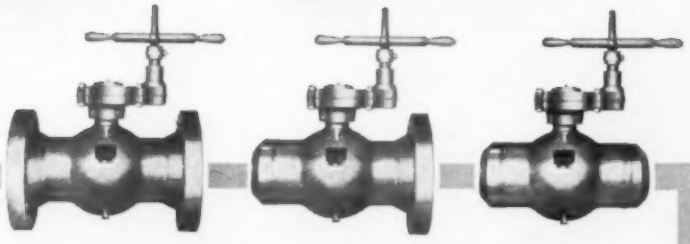
A Pennsylvanian discovery in Bartley field, less than 2 mi. east of Sleepy Hollow, was completed recently by Murfin and Lewis & Jones. Bartley is separated by dry holes from Sleepy Hollow.

It is 3 mi. from the south of Sleepy Hollow to the nearest failure to the southeast, and 5 mi. to the closest drilling directly south. Northward, 4 mi. separate production at the north end of Sleepy Hollow from the nearest failure.

**Closer (40-acre) spacing has been one of the various factors contributing to the big surge of activity.**

The 40-acre spacing contrasts with the 80-acre, or wider, pattern set up for most other recent Rocky Mountain discoveries.





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# Texas' Fairway Area Developing Fast

**Operators in the Fairway-Frankston area in East Texas already are planning secondary recovery methods, even though the area is not fully defined.**

Last month the Fairway pool counted its sixth oil completion from the James lime formation and thereby closed out its discovery status and moved into the development phase.

The pool's first five producers are in Anderson County, and the sixth is in Henderson County, making it a two-county pool.

The field also has two other wells completed but with gauges unrecorded, and eight tests being drilled, one of them in Henderson County.

The other pools considered part of the over-all area are West Fairway and West Frankston, west and northwest, respectively, of Fairway (PW—Feb.3 '61,p30). West Frankston also is in Henderson County.

**Secondary recovery, possibly miscible phase displacement, is planned to boost recovery beyond the 17½% of the oil in place estimated to be recoverable by primary methods.**

Fred L. Oliver, senior partner in the consulting firm of Fred L. Oliver & Associates, says a primary development aim is early definition of the field's productive area and determination of whether the three pools might join to form a single producing area.

He also adds that another aim is conserving the area's reservoir pressure through limitations on inside drilling.

Such programming is beneficial both in primary recovery and in long-range planning for secondary recovery. Miscible displacement is under consideration because it offers most in the way of ultimate oil recovery, he says.

His organization estimates oil in place at 64 bbl. per acre-foot. The wells have an average pay interval of some 40 ft., with well potentials ranging from a high of 570 b/d to a low of 217 b/d.

**Drilling also has been programmed to take advantage of the acreage factor in the field's proration formula.**

With completion of the sixth producer, Fairway lost the discovery bonus allowable of 200 b/d per well, as fixed by the Texas Railroad Commission's depth-bracket formula. Development now is under a one-year temporary commission order, which prescribes 80-acre proration units with allocation half on acreage and half on wells.

The commission order, however, also carries an 80-acre tolerance allowance, which permits 160-acre proration units, thereby doubling the acreage factor in the allocation formula.

Oliver says Fairway work has been in keeping with the 160-acre allowance, making it one of the few fields in Texas to be so planned in the initial stage.

**The over-all area for the three pools involved in the James lime play has increased to around 5 sq. mi.**

The West Frankston pool was extended 1½ mi. west early this month when Birdsong-Gabriel Oil Co., Tyler, completed its No. 1 W. F. Westbrook, John Raschall survey. It flowed 445.6 b/d of 49.6-gravity oil through 12/64-in. choke and perforations at 9,923-38 ft.

The new producer is 2 mi. north of the West Fairway pool. West Fairway has four completions, with no failures, and three tests being drilled.

***Northeast British Columbia's . . .***

# Record Drilling Season Ends

**Operators have chalked up at least five Middle Devonian natural gas successes as spring break-up ends the record drilling activity of the Ft. Nelson square of northeast British Columbia.**

A PETROLEUM WEEK survey, timed with the spring break-up in the region, shows the five successes were posted in the Clarke Lake, Petitot River, and Kotcho Lake areas. Another test was still being drilled at break-up, one was suspended for additional testing next season, and nothing further was reported on a third venture other than that it was a gas well.

On the negative side, the number of known abandonments totaled 18, with two more just across the border in the Northwest Territories.

Over-all activity in the area was roughly double the record pace of last season's drilling.

Among companies participating in the record activity were Western Natural Gas Co., Inc.; Home Oil Co., Ltd., Pan American Petroleum Corp.; Sinclair Canada Oil Co.; Texaco Exploration Co., operator for the Northern Foothills Agreement Group; Tennessee Gas & Oil Co.; Mobil Oil of Canada Ltd., Pure Oil Co., and Atlantic Refining Co.

**Despite the increased tempo of drilling in the area, there has been an average of only one hole drilled to every 128 sq. mi., reflecting the vastness of the region.**

There have been roughly 50 Slave Point Middle Devonian tests drilled in the approximately 6,400 sq. mi. encompassed by the play.

Clarke Lake field is 7 mi. southeast of Ft. Nelson; and the Petitot River and Kotcho Lake fields are some 70 mi. north and 45 mi. northeast of Ft. Nelson, respectively.

**One of the latest discoveries reported extends Clarke Lake field 5½ mi. eastward.**

Western Natural reported early in April that it completed Clarke Lake b-78-J (7) as a Middle Devonian gas well to make the present total east-west expanse of the field over 21 mi.

The discovery is 18 mi. southeast of Ft. Nelson, on Permit No. 195.

Western reported that "due to mechanical difficulties, the well flowed approximately 2-million cf/d of gas, when remedial operations were suspended to remove the rig.

In February, Western reported completion of its Ft. Nelson b-70-I (6) as a gas well with production from the Middle Devonian, which flowed at the rate of 10.3-million cf/d through ½-in. choke.

This well is 1½ mi. southwest of Ft. Nelson No. 3 on Permit No. 144.

**Another recent discovery was in the Petitot River area.**

Western announced this month that its Petitot a-81-L (3) was completed from the Middle Devonian for 10¼-million cf/d of gas through ½-in. choke. The well is located 1¾ mi. southeast of Western's No. 2 Petitot River.

**Discoveries also were made in the Kotcho Lake area.**

Western's Kathy b-30-F (2) was completed for 9,089,000 cf/d of gas from the Slave Point through ½-in. choke. This well is 5 mi. northwest of production and 8 mi. north of the original Kotcho Lake field discovery.

**Another gas success is reported at Komie Lake, midway between Clarke Lake and Petitot River.**

A Pan Am spokesman said the Komie Lake a-51-A was completed as a Slave Point well, but that no further

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In Pennsylvania, drilling with air, it is routine for one Reed Cobra bit to complete the hole from surface casing to TD. In this area total footage per Cobra bit regularly exceeds 7,000 feet.

Drilling with mud in East Texas in the tough Travis Peak formation Cobra bits consistently get runs up to 250 feet. Drilling with gas in Mississippi 10 Cobra bits drilled 6,850 feet in 358½ hours. In the same vicinity more than 10 times this number of tooth bits were required to drill the same footage with mud.

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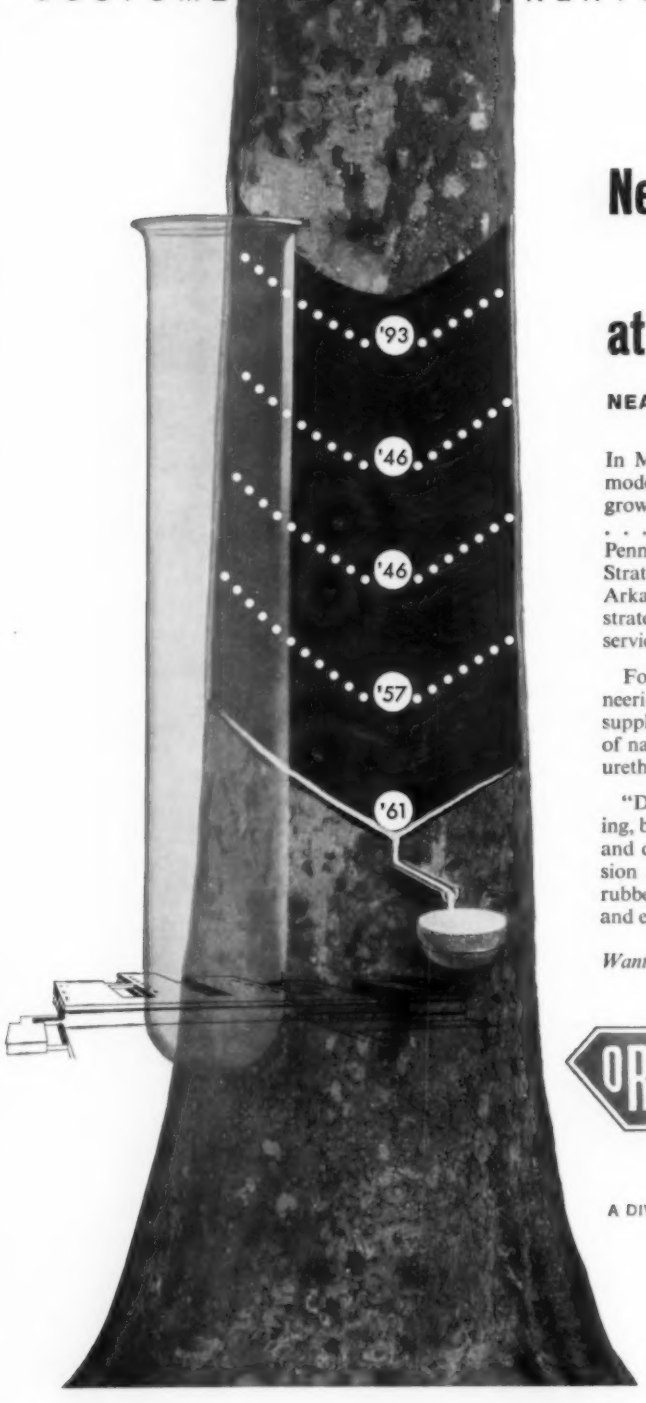


## New rubber plant to tap at Fort Smith, Arkansas

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information is being released now.

Texaco has a reported Slave Point success some 20 mi. south of Petitot and 13 mi. northeast of Pan Am's Komie Lake well. At last report, tests on Texaco's Tsea b-68-K were still under way, with the well to be left in a suspended state until next freeze-up, when more decisive information can be acquired.

Texaco also is leaving in a suspended state until next year—but as a potential Mississippian well—a test 14 mi. due north of Kathy No. 2. This is its Judy c-53-D. It's also been concluded that this will not be a Slave Point gas well.

**One post break-up venture is being carried out in the Beaver River area, 88 mi. west of Petitot River field and 3 mi. south of the Northwest Territories border.**

Pan Am No. 2-A Beaver River is 1½ mi. from the company's 1-A, b-63-K, which was abandoned this winter.

Stockpiling made possible the continuation of the 2-A operation past the end of freeze-up. Drilling of the test is not expected to be finished before late spring or early summer.

**The winter drilling program really didn't get under way until early January this year, some three weeks later than usual, due to late freeze-up.** Heavy snow preceded by about a month the real cold in the Ft. Nelson area. The 16-in. snow in November, compared with 9 in. last year, hampered seismic operations mostly, but it also might have deterred additional holes being drilled.

**Plans for a multimillion-dollar pipeline have been growing along with growth of reserves in the area.**

The Canadian Petroleum Assn.'s annual compilation of proved reserves shows a total of 3-trillion cu. ft. of gas for all of British Columbia at the end of 1960, compared with 1.8-trillion cu. ft. at the end of 1959.

An upward revision already is in order for 1961 on the basis of Western Natural's four gas wells. It has been estimated these four wells may add a little over a half trillion cu. ft. in reserves, bringing the total reserves for the Slave Point play alone over the 2-trillion-cu.-ft. mark.

Pipeline plans call for moving the gas via a 30-in. line from Ft. Nelson 250 mi. south to the Westcoast Transmission Co., Ltd., system.

Preliminary design and engineering for the project is being accelerated, and actual pipelaying is expected to be scheduled so that production from the various fields can be picked up by early summer of 1962.

No other sub-surface pump plunger has as many exclusive features as the Flexite Ring Plunger. Flexite Rings are made of a tough, hard fabric and phenolic resin compound and are precision ground for a "perfect circle" fit in the pump barrel. A special step-cut design allows each ring to expand to a highly efficient seal on the upstroke, and fall freely on the downstroke. Flexite Rings won't corrode, swell, nor disintegrate (even in sour oil), no pre-fitting nor soaking to size is necessary, and no special tools or fixtures are needed to make up the plungers. You can get them in all lengths and sizes for rod or tubing pumps. Your store or one of the many Harbison-Fischer representatives in all major pumping areas will be glad to give you illustrated literature containing full details, or write to us at P. O. Box 2477 in Fort Worth. There's no obligation.

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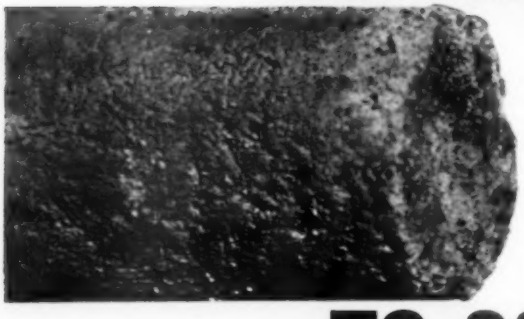

# TO 20,000 FEET!

A new improvement in bullet design has made practical — for the first time — sidewall coring at 20,000 feet.

At all depths the new bullet has provided cleaner, less altered cores to enable better laboratory analysis. Improved percentage of recovery has reduced the number of runs required and, thus, has reduced rig time.

This is another example of the persistent efforts of Schlumberger engineering. Tools and Services, both new and old, are constantly improved to do an even better job for the oil operator.

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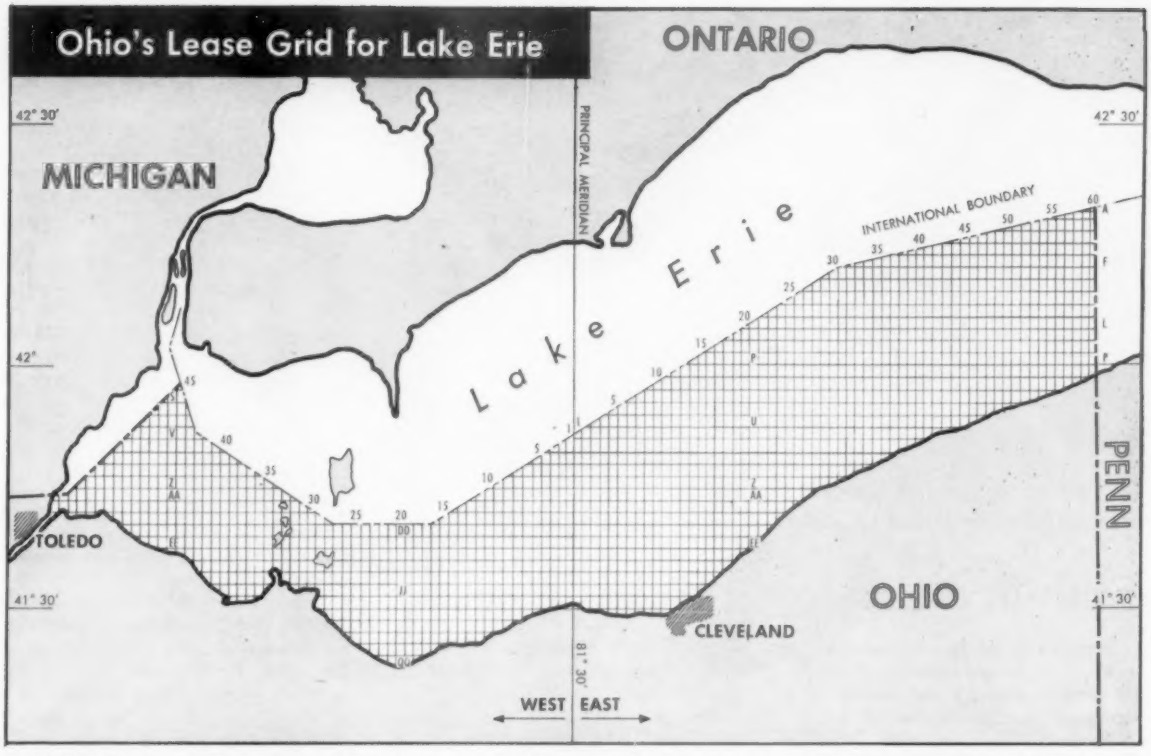



LEASE UNITS are numbered east and west from center meridian; lettered from north to south. Grid map, new rules indicate . . .

# Early Leasing in Lake Erie Is Likely

**First leasing of offshore tracts in Lake Erie off the Ohio shore may be in the offing now that the state has set up its lease procedure for the area.**

The "Operating Procedure for Leasing Areas and Producing Gas and Oil in Lake Erie" was devised by the Ohio Division of Shore Erosion, working with other agencies.

John R. Hyland, chief of the Division of Shore Erosion, says the 20-page copy of regulations governing leasing and production of gas and oil offshore has been sent to oil companies "and other interested parties."

Hyland notes that the rules are being made available at this time "for information only." It is not a proposal to lease, he adds, but merely an opportunity to review the operating procedure and to indicate areas of interest in bidding for leases.

**Some of the procedural rules, however, may have to be changed.**

Warren Calvert, chief of the Oil & Gas Section, Ohio Geological Survey, says the changes may be required to meet objections of some lake cities and towns, as well as some operators.

**A grid map of Lake Erie has been drawn up, providing for lease units consisting of parallelograms encompassing 2.21 sq. mi. each.**

The lease units are equal except along the shore, state, and international boundaries.

Numbered units have been established, with tiers extending north and south of latitude 41 degrees, 30 minutes, and north of latitude 42 degrees, at regular intervals of 1 minute, 30 seconds. The rows extend east and west from longitude 82 degrees, also at intervals of 1 minute, 30 seconds.

**Comprehensive rules governing leasing of onshore state-owned lands also are being drawn up.**

O. E. Alderman, chief of the Division of Forestry, says these regulations should be completed within a month.

**Bidding will be on a sealed-bid basis, with cash bonus minimum of $1.00 per acre, and 1/8 royalty.**

Separate bids will be required when more than one lease area is being bid, and a bid will not be accepted for less than a whole lease area.

Bids on a royalty basis alone may be set up in lieu of cash bonus, again with a 1/8-royalty minimum.

Annual rental will be $1.25 per acre. Leases are to run five years, renewable on a yearly basis.

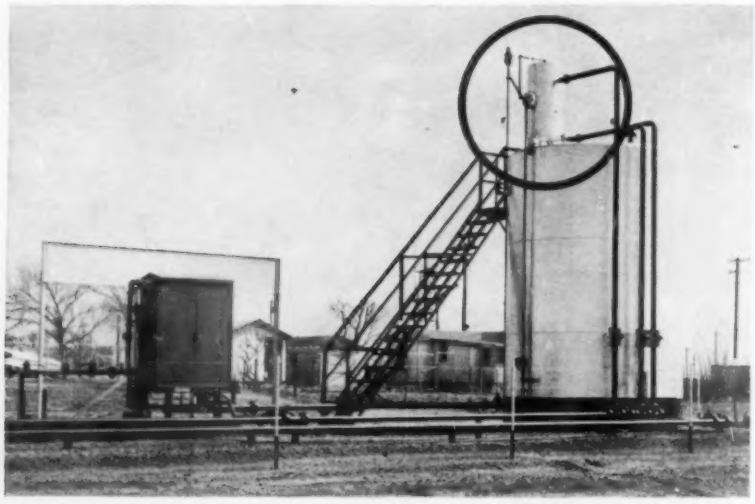
**Drilling of the first hole must be commenced within 18 months of the lease date, with one hole per year required thereafter.**

Drilling will not be allowed within 1 mi. of shore, except with permission of the Division of Shore Erosion. Nor will drilling be permitted within 1 mi. of the intakes for municipal or industrial water supplies.

**Various reports that will be required of operators reflect the apparent firm grip the state intends to exercise over offshore operations.**

Prior to drilling, operators will have to submit details on the drilling structure to be used, well-casing program, location (including projected bottom-hole location if a hole is to be directionally drilled), geological data, and waste disposal plans.

After discovery and prior to development, operators will have to submit information on number and location of proposed holes, well-casing program, transport arrangements, changes in original plans, "and such other data as the Division of Shore Erosion may prescribe."



STABILIZING VESSEL, circled, is mounted on deck of a surge tank. Vessel can . . .

# Stabilize Crude on Small Leases

**Separation of the lighter components of crude can be more profitable on small leases by installation of a compact stabilization vessel.**

William B. Davis and Leon B. Dorsey, both of Sinclair Oil & Gas Co., report that the development will help reduce the losses many leases incur through crude shrinkage in stock tanks.

Some operators offset these losses by crude stabilization, which is a process in which the more volatile components are separated from less volatile components.

Stabilization is designed to: (1) effect condensate separation and recovery; (2) reduce loss of stock-tank vapors; and (3) gain a more stable crude for delivery to pipelines. Stabilization also has increased the gallons of liquid content per Mcf. of gas.

The possibility of gas "breakout" in automatic custody transfer units with positive displacement meters also is lessened by a more stable crude. Stock-tank weathering time, too, is reduced.

Stabilization may be effected by stock-tank weathering, which is inefficient and uneconomical, they say; by the use of tall stabilizing towers, which are relatively expensive and not applicable to small leases; or by stage separation, which is the process involved in Sinclair's approach.

**The stabilization vessel is designed to reduce loss of stock-tank gases that are normally vented to the atmosphere.**

David and Dorsey note that, on the average, "it can be anticipated that approximately 3% of the liquids dumped from separators or treaters will not be retained in atmospheric stock tanks."

Sinclair approached the problem with the idea of drawing the volatile gases from the crude before it enters the stock tanks.

**The stabilizing vessel developed for the task is low in cost, with virtually no maintenance expense.**

The Sinclair team said the unit cost approximately $450 for purchase and installation, including a gas outlet connected to a vacuum gathering line.

On one lease, producing only 22 b/d of oil, the stabilizing vessel paid for itself in seven months. On a lease producing 230 b/d of oil, the payout was only one month, roughly.

On the small lease, the average daily volume of gas was increased by 4.46 Mcf., and gallons of liquid content per Mcf. was raised from 3.06 to 3.40. On the larger lease, additional gas gathered by the stabilizer was 18 Mcf., and gallons of liquid content per Mcf. was much higher than that of gas obtained from well casings and from treaters.

**The 4-ft.-high vessel is mounted on the deck of a stock or surge tank. Crude enters through a 2-in. opening on top of the vessel.**

When the crude enters, it falls on a splash plate, which tends to atomize the crude and aid in the breakout of the lighter components.

A 2-ft. depth of fluid is maintained in the 24-in.-diameter vessel to provide retention time. A vacuum in the vapor space above the fluid also increases the flashing, or breakout, of the lighter ends.

The vessel is connected to the vacuum gathering line through a flow-actuated pilot valve. As the fluid level rises, because of an increase in vacuum, a ball float rises and closes the pilot valve. The resulting increase in pressure, due to the vapors flashing out of the incoming liquid, lowers the fluid level and discharges a portion of the fluid through a 2-in. outlet connection to the tank. When the level falls approximately 1 in., the pilot valve opens and vapors again are liberated to the vacuum gathering line.

The vessel must be set on top of the tank so that when it is operating at a slight vacuum, the fluid level in the vessel will be sufficiently above the tank top to provide ample head to gravity the oil from the vessel, through the fill line into the top of the tank.

Davis and Dorsey noted that while installations to date have been made with the stabilizing vessel delivering gas into a vacuum gathering line, such gas could also be delivered into a low-pressure line, operating at 40 psi. or less, by utilizing a small booster compressor unit.

The two reported on the development at the recent Mid-Continent District, Division of Production, American Petroleum Institute meeting at Oklahoma City.

## Bit Cones Replaceable

**This Varel Manufacturing Co. DWV drill bit enables an operator to change only one section if a cone or blade wears out or breaks off before the others.**

**The replaceable cone and blade bits, to be available in two- and three-cone models and two-, three-, and four-way blades, all fit into the same holder, eliminating need to change subs when switching from one type to the other. Initial sizes to be manufactured will be in 4¼ in., 4½ in., and 4¾ in.**

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# What's New / IN EXPLORATION, DRILLING, PRODUCTION

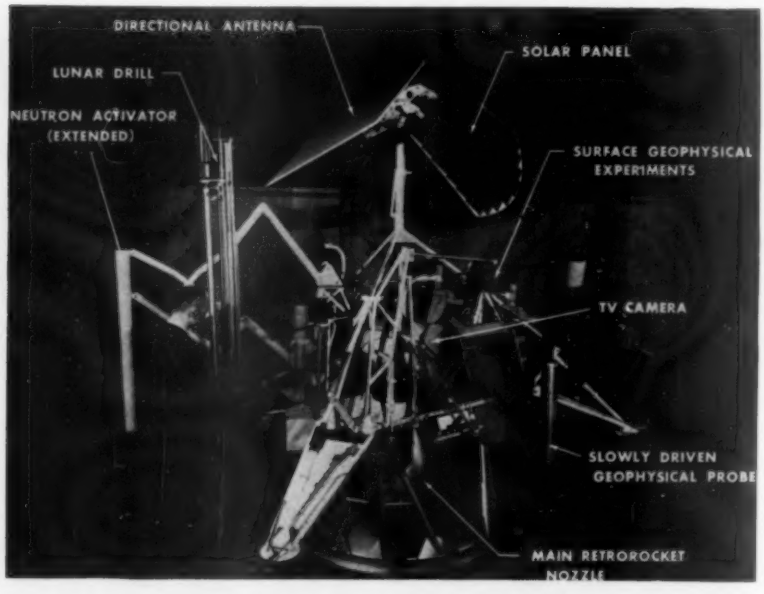
## First Mohole Tests End; Big Effort Two Years Off

**Despite the success of the first stage of the Mohole project, the actual attempt to drill through the earth's crust is believed to be at least two years off.**

The National Science Foundation announced last week that preliminary drilling off Guadalupe Island in the Pacific was stopped because the planned experiments had been completed and the allotted funds for this phase of the project, some $1.5-million, had been exhausted.

The preliminary test in 12,500 ft. of water indicated the feasibility of drilling through the earth's outer crust, and penetrating the Mohorovicic discontinuity to reach the earth's upper mantle, at an estimated 30,000 ft. or so in that area (PW—Apr.7'61, p20).

Project scientists found temperatures 500 ft. below the ocean bottom were higher than anticipated; that ancient sea life in the area was prolific for 7-million years, though the area is virtually an oceanic desert today; and that the second layer of oceanic crust —some 500 ft. below the ocean floor —was composed of basalt.




## Unveil Spacecraft for Moon Drilling

**This is the first picture of a full-scale model of the Surveyor spacecraft to be shot to the moon sometime between 1963 and 1966, according to present plans. Included in the equipment is a drilling device developed as a result of studies made by Hughes Tool Co. engineers last year (PW—Nov.4'60,p20).**

**The lunar drill is designed to penetrate the moon surface to a depth of from 18 in. to 60 in. As drilling proceeds, small fragments of the moon's crust will be collected from the hole and distributed to different instruments on the spacecraft for analysis. One of the spacecraft's four TV cameras also will be used to monitor the drill so that scientists on earth can watch the operation.**

**It's estimated the 750-lb. Surveyor will reach the moon in 66 hours. Rockets will be used to permit a landing on the moon at around 6 mi. per hour, or slightly slower than a manned parachute landing on earth. It's also expected that the Surveyor will operate on the moon's surface for about a month.**

**Hughes Aircraft Co. has been selected by the National Aeronautics and Space Administration to build the 11-ft. high Surveyor. Construction will be under the technical direction of California Institute of Technology's Jet Propulsion Laboratory, Goldstone, Calif. Hughes will build seven of the spacecraft.**

## Macaroni Tubing Eases Slim Hole Workover Job

**A unique use of macaroni tubing has helped solve a workover problem in a permanent (tubingless) completion in north Louisiana.**

Petro-Atlas, Inc., worked over a dry hole near Haynesville and installed the permanent completion by setting 10,857 ft. of 2⅞-in. tubing, with perforations at 10,684-704 ft. The well then flowed 98 b/d for three months, then stopped.

The trouble was diagnosed as a salt bridge in the pipe. Petro-Atlas used 10,650 ft. of 1¼-in. seamless macaroni tubing (from Jones & Laughlin Supply Division) to carry out the workover. The tubing was furnished with Aztec joints for reduced joint diameter.

A two-cone bit was attached to the macaroni string and rotated with power tongs for some six hours at approximately 30 rpm. When the bit came out, it was discovered that there was junk in the hole, rather than a salt bridge.

Seven round trips, including drilling, milling, and reverse circulating with a junk basket on the bottom, were required before the well was finally cleaned out to 10,711 ft. The well was perforated again, a wire line packer set, and the 1¼-in. macaroni tubing previously used for drilling was set as a production string.

Result: The well is flowing again.

•

**The Alabama State Oil & Gas Board will meet next week to consider approval of a waterflood unitization plan for the Citronelle pool, the state's largest, following approval by 75% of the royalty interests.**

Approval by the required 75% of royalty owners came last week. More than 75% of the working interests in the 5,687-acre unit agreed earlier (PW —Feb.24'61,p33).

Approval by the state board is expected to be automatic.

Citronelle's unit will have a three-way participation formula, including a six-month production factor from Aug. 1, 1959, through Jan. 31, 1960. The unit will be expanded annually to accept wells with a minimum of 21 months of production.

A pilot water plant is expected to

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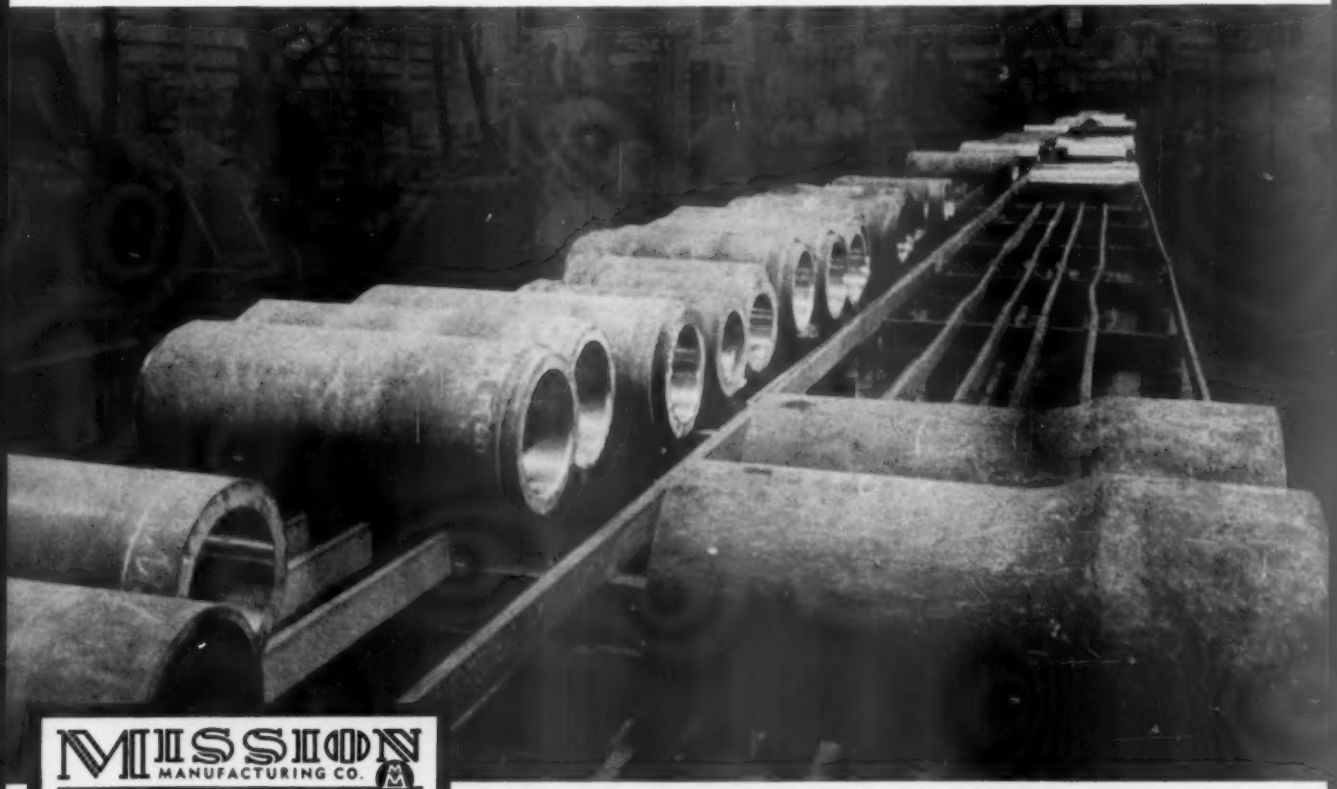

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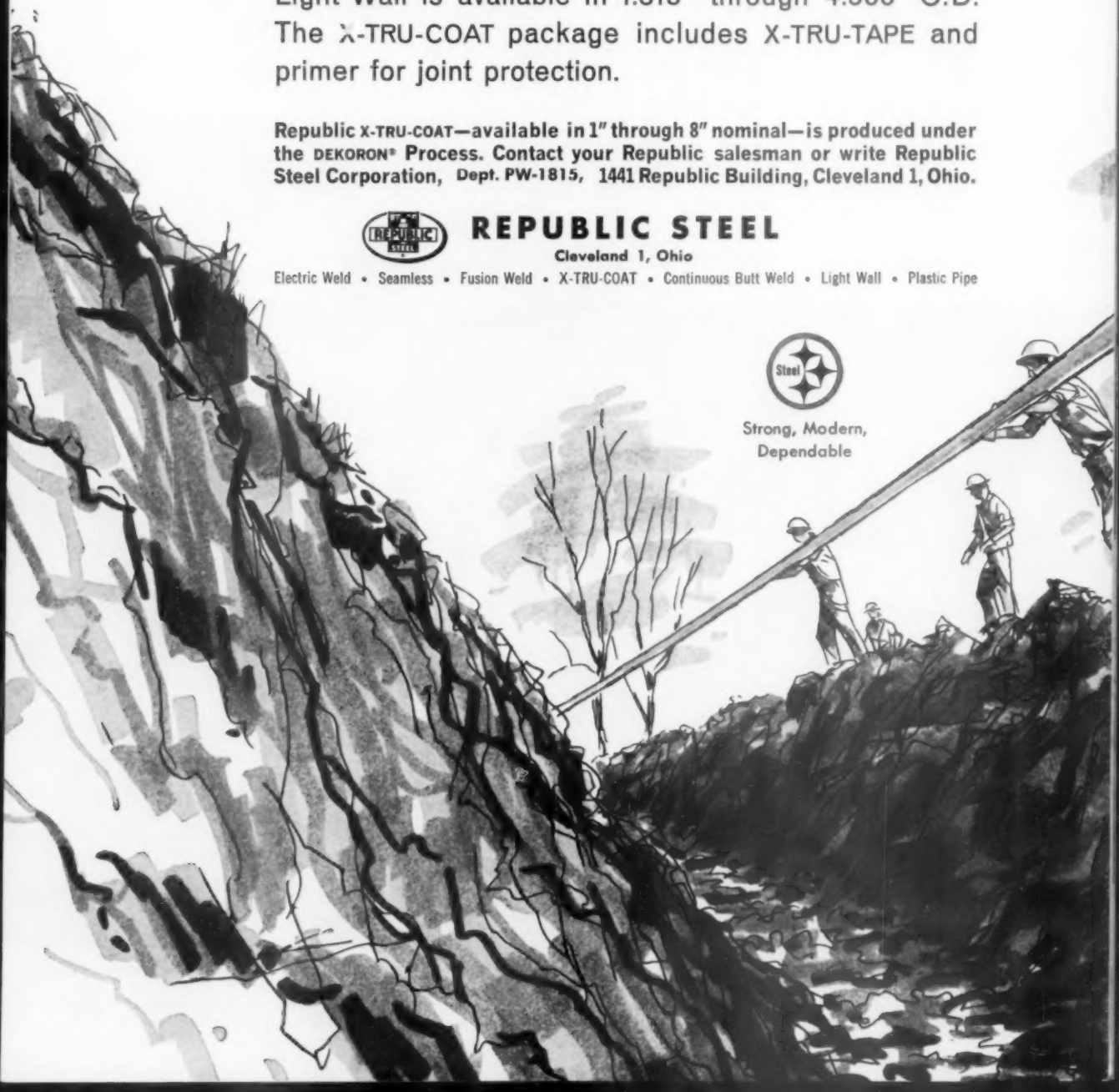

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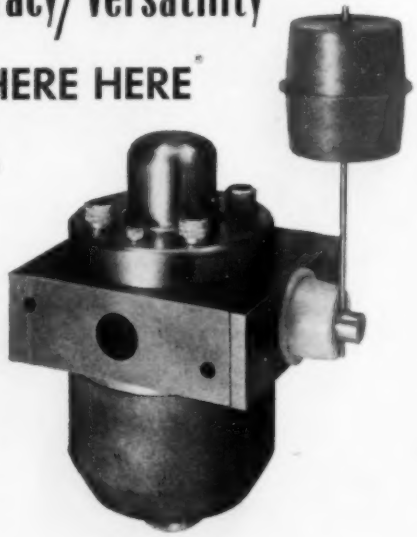

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be in operation by May 1. The waterflood will cost some $1-million this year and $20-million during the life of the unit. Principal operators have underwritten in advance the cost of the pilot plant in an effort to get the flood in operation at the earliest moment, because of dwindling bottomhole pressures.

The unit's engineering committee predicts that the unit will be producing more than 8-million bbl. a year by 1963 with a waterflood, compared with 3.5-million bbl. without injection.

•

**Oil and gas leases on Indian and school lands in Oklahoma and Wyoming have drawn total bonus bids of $185,951. Another sale of Indian lands is scheduled next month in Oklahoma.**

The largest total, $97,810, was paid for 18 tracts, containing 1,966 acres, offered by the Oklahoma School Land Commission. Gulf Oil Corp. was high bidder, offering $32,104 for approximately 190 acres in the South Powell pool, Marshall County.

In the first sale of oil and gas leases under the new 16⅔% royalty rate for Indian lands, the Muskogee (Okla.) field office sold ten tribal tracts, containing 2,547 acres, for $17,386, an average of $6.82 per acre. The agency also sold 36 allotted tracts, comprising 2,728 acres, for $37,162, an average bonus of $13.62 an acre.

At Ft. Washakie, Wyo., Mobil Oil Co. was high bidder for 12 tracts of Wind River Indian reservation land. Mobil's bids totaled $33,593 for 3,680 acres, an average of $9.13 per acre. No other bids were received on 17 other tracts offered in the same area, sections 20 to 26-5n-1e, north of Pavillion, on the east flank of the Little Dome area.

Bids will be opened next week for 186 tracts of Indian land, covering 19,053 acres, in the Kiowa (Okla.) area.

•

**A gas-processing plant with an ultimate capacity of 62-million cf/d is planned for the Dover-Hennessey area in Kingfisher and Garfield Counties, Okla.**

Humble Oil & Refining Co. will operate the plant. Bids for construction will be submitted by contractors in the near future. Completion is scheduled for late in the year.

•

**The Washington state commissioner of public lands has called for**

**bids on three portions of submerged lands to be opened May 23.**

The tracts, totaling 1,253 acres, are in section 15-18n-12w, Grays Harbor County. They were put up for lease on application of Robert D. Allen, Seattle.

•

**Operators estimate they will recover an additional 18-million bbl. of oil under a $500,000 pressure maintenance program in Prado field, Jim Hogg County, Southwest Texas.**

Prado Oil & Gas Co. told the Texas Railroad Commission that the proposed water and gas injection in the Middle Loma Novia I, II, and III reservoirs also would produce an additional 3.8-trillion cu.ft. of gas. The three zones contain 161 wells.

•

**Steps are under way to start a pressure maintenance program that is expected to more than double ultimate recovery of oil in the newly formed McComb unit, Pike County, Miss.**

Sun Oil Co., operator, plans a field-wide water injection program, a drilling program of some 25 tests to define quickly the outer limits of the field, consolidation of individual tank batteries, and installation of automatic custody transfer equipment.

•

**Ambassador Oil Corp., Ft. Worth, has acquired half interest in two gasoline plants in Campbell County, Wyo.**

One plant, in Lonetree field, has a capacity of 5-million cf/d and the other, 50 mi. away in Rozet field, has a capacity of 2-million cf/d.

The Noble C. Ginther interests of Houston own the other half interest in the two plants and will operate them. Combined cost of the two plants was more than $600,000.

•

**Lone Star Gas Co. is working on an $850,000 expansion program for its natural gas processing plant in Palo Pinto County, West Central Texas.**

The expansion involves a 2,000-hp. compressor and a dehydrator unit, and will increase capacity from 45-million cf/d to 65-million cf/d.

The project is being built in conjunction with the company's 18-in., 52-mi. natural gas pipeline between Gordon and Springtown, where the line connects with the company's

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•

## Drilling Highlights

**Nebraska**—Tipps Drilling Co. and Sage Oil Co. No. 1 Haag, section 31-2n-26w, Red Willow County, recovered 331 ft. of oil and 60 ft. of very heavy oil-cut mud on drillstem test of the Lansing-Kansas City at 3,238-85 ft. The prospect is 2 mi. southeast of Silver Creek pool in the active Cambridge Arch area play (see page 26).

First production in Furnas County, adjoining Red Willow County on the east, was effected by Exeter Drilling Co. No. 1 Palmer, section 17-2n-25w, completed on the pump for 131 b/d of oil through perforations at 3,391-94 ft. in the Reagan (Cambrian). The discovery is 7½ mi. east of Pennsylvanian production at Silver Creek.

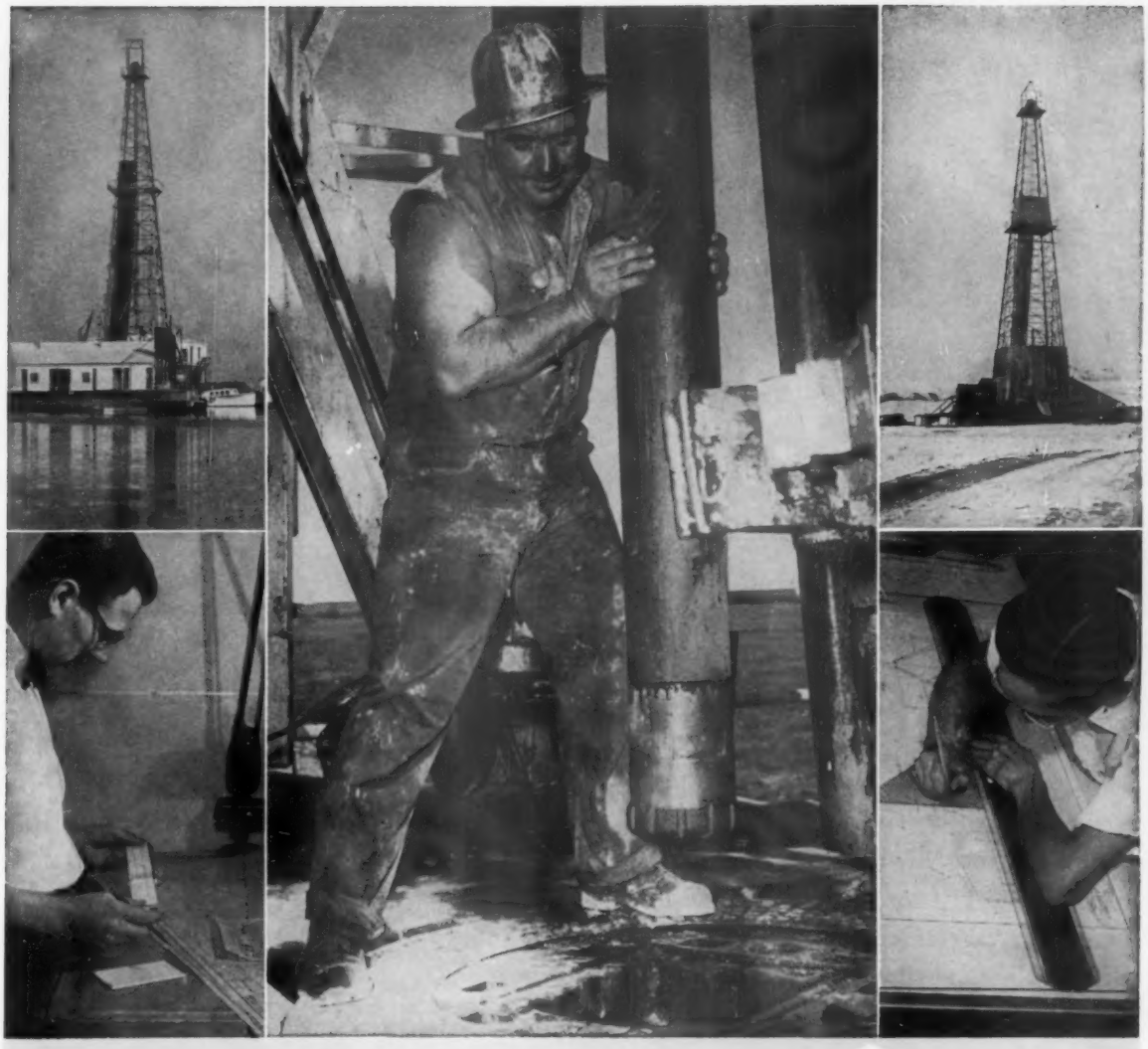
**West Texas**—Ohio Oil Co. No. 1 Vinnie C. Linker, labor 21, league 30, Baylor County School Land, A-2, Hockley County, flowed 207 b/d of 37.5-gravity oil through ½-in. choke and perforations at 7,368-69 ft. in the Clear Fork. The discovery is 3 mi. northwest of North Clauene pool.

In Kent County, Ohio Oil No. 1 Nellie McLaury, W. P. Wilson survey No. 7, was completed for 240 b/d of 39.5-gravity oil through 20/64-in. choke and perforations at 6,609-11 ft. in the Strawn. The discovery is 2 mi. northeast of North Clairemont pool.

**Texas Panhandle**—Amarillo Oil Co. No. 1 M. B. Broyles, section 978, block 43, H&TC survey, Lipscomb County, flowed 7-million cf/d of gas through perforations at 7,359-71 ft. in the Cleveland. The opener is 2 mi. northwest of Mammoth field.

**Northwest Louisiana**—Barnwell Drilling Co., Inc. No. 1-C Minden Unit, section 16-19n-8w, Webster Parish, was completed for 250 b/d of 36-gravity oil and 200,000 cf/d of gas through 10/64-in. choke and perforations at 7,424-40 ft. in the Paluxy. The pay opener is ½ mi. north of gas production in the salt dome Minden field. Operator also is testing a dual pay (Paluxy and Mooringsport) oil prospect on the north flank of the dome, 1 mi. northwest.

**Utah**—H. M. Byllesby No. 3 Byllesby, section 23-13s-20e, Unitah County, flowed 2-million cf/d of gas through perforations in the Mesaverde at 5,260-6,757 ft. The wildcat is 20 mi. east of Peters Point pool.



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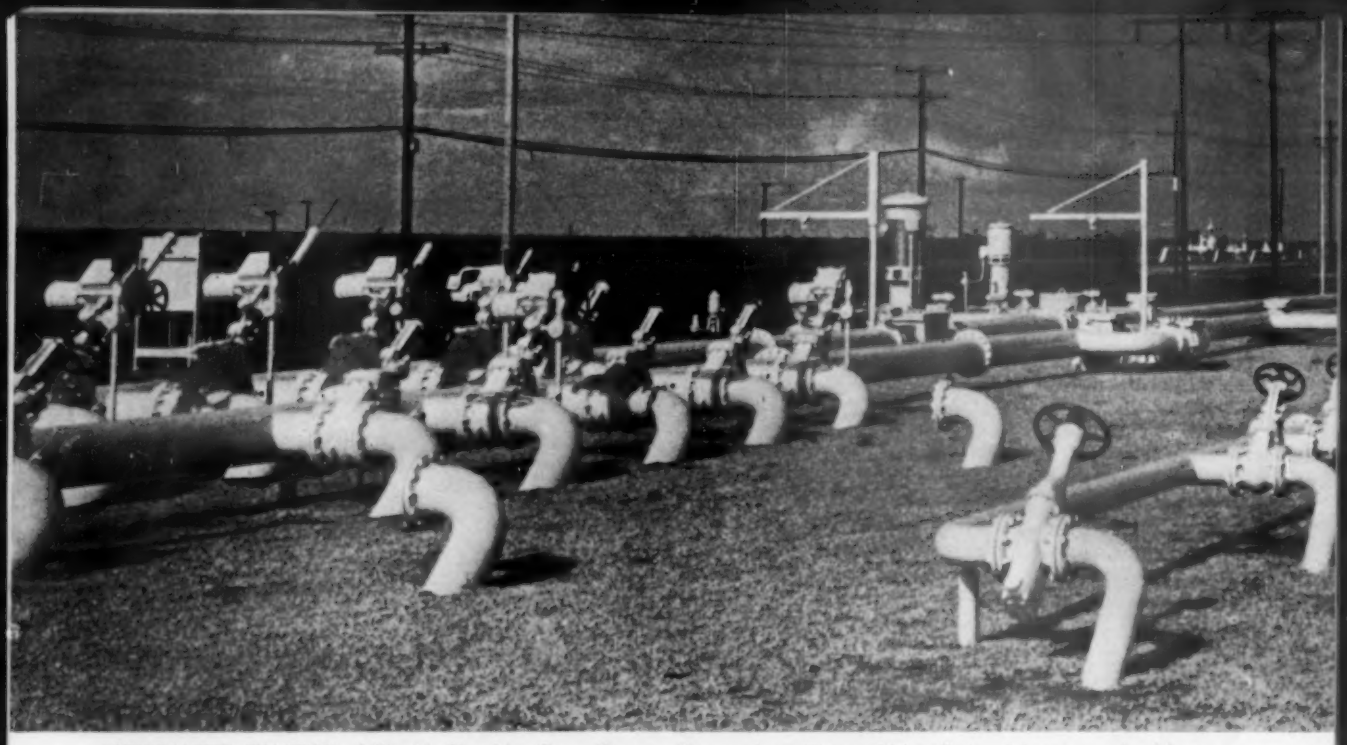


AUTOMATED STATION of Humble Pipe Line Co. at Kemper, Tex., replaces 35-year-old installation. It's one sample of how . . .

# Pipeline Companies Spend Heavily

**As much as 80% of the total expenditures earmarked for improvements this year may go for control instrumentation. But the investment is expected to pay off handsomely in lower operating costs and higher efficiency.**

**Between 60% and 80% of this year's expenditures on improvements by the pipeline industry will be for automation. This indicates an increasing reliance by the industry on automation as a tool to decrease costs and increase efficiency.**

Not long ago, there was still a core of pipeline men who took a dubious—if not downright disdainful—view of the promised benefits of controlling a pipeline by some form of remote, supervisory, or automatic control.

In the early years of the evolution of pipeline control equipment and techniques, there was justification for this wait-and-see attitude, since the equipment and techniques were still being proved out.

Today, however, there's hardly a pipeline operator to be found who isn't sold on some degree of unattended operation.

What, apparently, has largely convinced the industry that most of the 'bugs' have been worked out is the performance of some of the earliest systems built. One is the remote-control setup on the 447-mi. products line of Laurel Pipe Line Co., which went into service in June, 1959, and has been working to the satisfaction of its owners ever since (PW—Oct.9'59,p82).

After three years of operating experience at its pilot satellite station at Linden, N.J., Texas Eastern Transmission Corp. reports that "the application of the remote control concept has more than met expectations in both reliability and adequacy of service rendered. . ."

Performance of the remote system on the gas pipeline of Columbia Gulf Transmission Co., which, while not finally completed until this year, was actually begun in 1954, has also been gratifying.

**Crude and products pipelines are ahead of gas lines in automation, for the reason that pump stations—because they are smaller—are easier and less expensive to put on remote or local automatic control.**

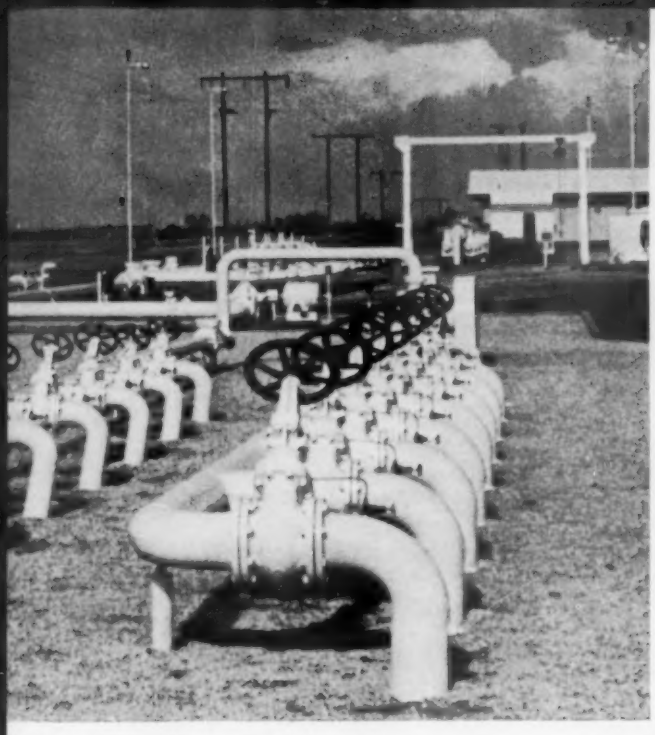
A compressor station has many more engines than does the typical pump station, because vastly greater horsepower is required to push gas through the line.

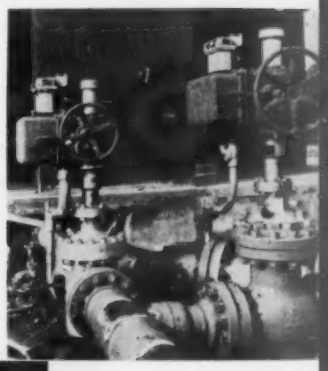
A spokesman for a control instruments firm asserts, "I would say offhand that a compressor station has five to a hundred times as much automation to deal with as a products pumping station."

For the most part, he says, "the gas industry is still in Phase I of automation."

At the same time, he points out, some gas transmission companies are in an advanced stage of automation, characterized by the operation of satellite stations (stations that are remotely controlled from another station). Two examples are Texas Eastern Transmission and Colorado Interstate Gas Co. (PW—Jun.24'60,p98).

**The amount of remotely controlled horsepower at pump stations on crude and products lines more than doubled in the 1958-1960 period,** according to an American





GATE VALVES on Bayou line operate by electric motors and open and close automatically.

MODIFIED PUMP at Bayou's Port Neches (Tex.) terminal.

# for Automation

Petroleum Institute report on "automation and instrumentation."

In 1958, 32% of all crude and products pump stations were under varying degrees of remote or automatic local control; 24% were unattended; and 14% were partially attended. By 1959, the percentage of stations that were controlled remotely or automatically had jumped to 35. And 18% of all stations were partially attended, while 24% were still unattended.

And by 1960, 37% of all stations had some form of remote or automatic control. The percentage of stations on unattended operation dropped slightly to 22, but the percentage of stations on a partly attended basis rose to 21.

**The cost savings in automation result in part from relieving men of their control jobs along the line.**

Other employment is found for many of the men whose jobs are now being performed by control instruments, and several companies let attrition and/or expansion solve the problem.

Another way pipeline companies are cushioning the impact of automation on the worker is by putting in instrumentation gradually.

**Automatic controls also greatly increase the efficiency of a pipeline. Main reason is that they decrease the possibility of human error.**

With today's more advanced remote-control arrangements, one man can control every facet of an operation on the most complex line.

An example is the LP-gas line of Mid-America Pipe Line Co., which is equipped with a centralized transport control system designed and built by Union Switch & Signal, a division of Westinghouse Air Brake Co.

From Tulsa, one man is able to adjust flow and pressure, close or open pump stations, and discharge LPG at terminals, anywhere along the 1,700-mi. pipeline.

## Several 'Old' Lines Automated

**Many pipeline companies are finding that it's necessary to automate lines and stations that have been in service even for many years.**

It's easier to design a control system for a new pipeline—primarily because you can select the type of station equipment best suited to the control facilities planned.

But most of the country's pipelines were in the ground long before remote and automatic control techniques were developed. And most of them will be operated for a long time to come, since they represent extensive investments. So it pays to improve their efficiency—if the necessary outlay will be offset by higher performance.

**A notable example of a pipeline of considerable age that has just been automated is the Bayou Pipe Line System, whose installation dates from 1942.**

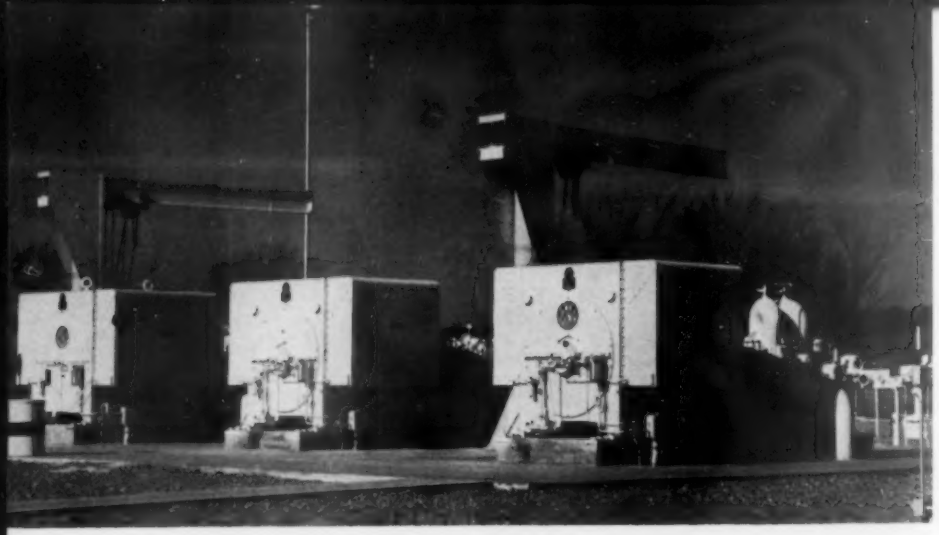
The product system's five pump stations were converted for operation under remote and station level (autonomous) control to cut operating costs.

The system, operated by Service Pipe Line Co., consists of 250 mi. of 8-in. and 10-in. line between Baytown, Tex., and Baton Rouge, La.

Actual age of the pipe in the lines is difficult to calculate, since the pipe, and other equipment, were second-hand. The pipeline was built at the request of the Petroleum Administration for War out of materials salvaged from other lines throughout the country.

Through careful maintenance and corrosion control, the line has given good service. But until last year, when

continued ▸



**SPECIAL REPORT PIPELINE AUTOMATION**

PARTIALLY UNATTENDED **station on Service Pipe Line Co. system, where three electric motors with a total of 4,250 hp. drive three centrifugal pumps.**

installation of control devices was begun, few changes had been made in the original facilities.

**Pump stations at Hankamer and Fannett, Tex., are controlled remotely from Baytown, while stations at Buhler, Basile, and Courtableau, La., are operated from a terminal at Port Neches, Tex.**

Operators at the two control stations can start and stop individual pump units and sump pumps at the intermediate or relay stations under their supervision. All terminals are also outfitted with remote tank gauges.

**Much of the operation of the intermediate stations is accomplished autonomously.** The stations have been furnished with automatic shut-down mechanisms, pneumatic controls to regulate pressure and flow, and automatic gate valves.

Old, manually operated suction and discharge gate valves were replaced with motor-operated valves that open and close automatically when the pump units start and stop.

In addition, scraper traps, together with gate and check valves, were removed at all intermediate locations, so that it is now possible to run scrapers direct from Baytown to Port Neches, and from there to Baton Rouge.

A detector was installed upstream from each station, which alerts the station when a scraper is approaching. On a signal from a detector, automatic control equipment shuts down the pumps and closes suction-line valves so that the pig is diverted past the station. When it later passes the detector downstream, the station is signaled, and the pumps switch back on automatically.

Sump pumps at stations can be controlled remotely, but in practice a pump is shut off by station-level instrumentation once it has been evacuated. Each pump, however, is fitted with a device that signals the control stations in the event of impending overflow. Generally, sump is selectively discharged into a product stream it will not downgrade.

Locally controlled automatic shut-down instruments, which function only in emergencies, are circuited in such a way as to relay a warning signal to the control station, so that the malfunction can be defined.

**Working tanks are situated only at terminals, with intermediate stations being operated on a closed system.**

Tenders are handled mostly in segregated batches to the eastern terminus of the line. Capacity of the Baytown-to-Port Neches section is 43,000 b/d, and of the Port Neches-to-Baton Rouge segment, 52,000 b/d.

**One of the oldest systems in the country being rebuilt for remote control is the 31-year-old gas line network of Mountain Fuel Supply Co. in Wyoming, Utah, and Colorado** (PW—Jan.13'61,p49).

One reason for the changeover is that the pipe was beginning to spring leaks, which now will be spotted remotely by a change in differential pressure.

An additional factor was that harsh winter weather in the area traversed by the line had severely hampered manual operation.

**Humble Pipe Line Co. is in the final stages of a broad modernization program, keyed to automation, which was launched in 1955 to "improve the company's profit picture in the ruggedly competitive pipeline business."**

In addition to converting many stations for unattended service, the company is also now using meters for measuring the contents of tanks and for automatic custody transfer.

"With improvements like this, Humble Pipe Line Co. is chalking up important gains in flexibility, economy, and functional effectiveness," a spokesman says. "Operating expense at main stations and booster outposts is substantially reduced. Equipment and station maintenance is cut to the bone. Tank switching is held to a minimum, and costly vapor loss is curtailed. Safety is enhanced. And valuable manpower is freed for more useful, creative work."

**The company has replaced its 35-year-old Kemper station, in West Texas, with a remote-controlled installation, and is completing like replacement of its Satsuma station, near Houston.** The stations are on Humble's 370-mi., 18-in. trunk line that carries West Texas crude to the Gulf Coast.

Besides pumping seven different grades of crude through this line, the Kemper station also moves crude through a system of 10-in. and 12-in. lines to Humble Pipe Line's Harbor Island ship terminal and to Corpus Christi.

Pumps at Satsuma push crude on to Humble's Baytown refinery and to tanker-loading docks on the Houston ship channel.

The stations, therefore, are two of the most critical on Humble's crude network, and the company's decision to replace them with electric-powered, automated installations underscores the importance that it puts on automation as a way of improving its operations.

As part of the project, three booster pump stations on the Kemper-Satsuma line—at Fort McKavett, Eckert, and Warda—are being converted for unattended operation from Kemper.

**continued ▸**

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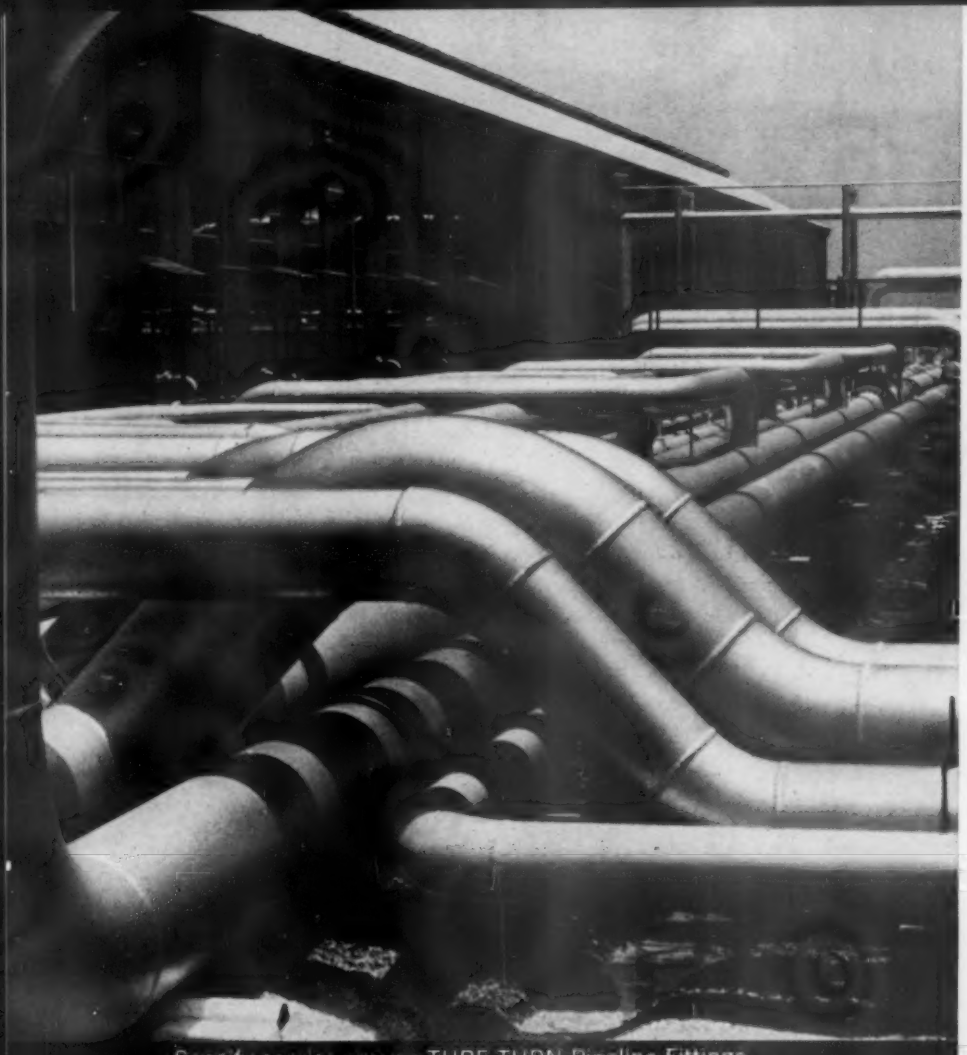

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## Type of Power: A Key Decision

**A prime decision when putting automatic controls on a station powered by internal-combustion engines is whether to substitute electric motors. The latter are easier to operate remotely, while the former are cheaper to run—if fuel is available.**

From a standpoint of automation, therefore, companies using chiefly electric motors have the edge. The majority of crude and products line stations are driven by electric motors. On the other hand, compressor stations on gas pipelines—because fuel can be taken right off the line—are largely powered by internal combustion engines.

**An electric motor is started simply by pushing a button, while several preliminary steps are involved in putting a combustion engine on line.**

In the case of a diesel engine, for example, the operator at control headquarters first starts it; then, he must allow time for several things to occur—such as the circulation of the lubricant and the heating of the jacket water to the proper temperature—before putting the motor on line.

With electric drive, he presses a button at headquarters and the pump is on line in a matter of seconds.

Additional advantages cited for electric units are lower initial cost and easier maintenance.

**Electric power is usually preferred at new installations by Standard Oil Co. of California, Western Operations, Inc.**

Stancal emphasizes that each time a station is to be built, the decision of whether to install electric, diesel, or steam power is made anew. For most recent installations, however, electric power has been chosen.

In addition to the fact that "it is easier to automate an electric station," a spokesman says, the company has found that the motors are cheaper—usually even counting in the cost of power-line extensions—and that they are simpler to maintain.

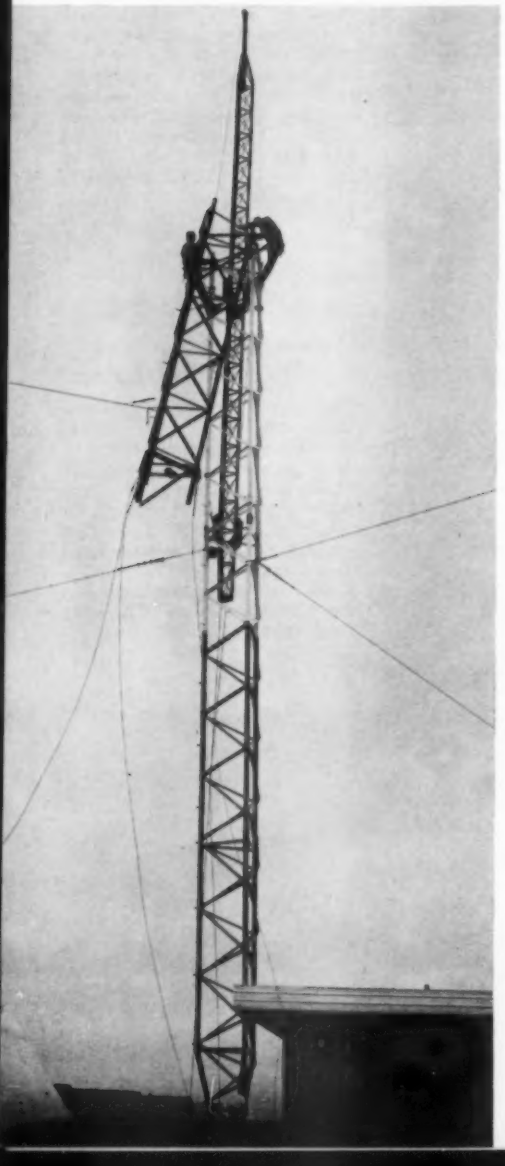
He points out that the cost of power itself is heavy, but usually balances off against the cost of fuel.

**Pacific Gas & Electric Co. will install gas-powered engines on the new line it's building to move gas from Canada to San Francisco, even though the line will be remotely controlled** (PW—Feb.24'61,p46).

The line is expected to be in operation next winter, delivering an average of 414-million cf/d of gas.

PG&E stresses that the figure is an average, which means that some days the quantity shipped through the line may be much less—and some days much more. A spokesman says there is "real dependability" and economy in using gas engines where gas is delivered on a fluctuating basis, since compressor requirements will be uneven, and therefore an investment in permanent electric-power lines would be wasteful.

MICROWAVE TOWER 300 ft. high goes up at Magnolia Pipe Line's Midland (Tex.) pump station.



## What Must Be Telemetered?

**With the cost of telemetering equipment considered a sizable item in any control system, pipeline companies today are giving deep thought to the question of just how much information is needed to run a pipeline effectively.**

Even though the cost of a control system is only a small part of the total cost of a pipeline—particularly if it is a long-distance line—companies are not prone to shell out any more dollars than they have to to get the kind and degree of automation they want.

This is a logical attitude, since the prime purpose of automation is to shave costs. One good way to keep the cost down is to hold the amount of data that will be relayed from remote stations to headquarters to the minimum needed to run the line effectively, some experts feel.

**The thinking among pipeline companies seems to lean toward providing for transmission of less—rather than more—information than is relayed in some systems now in operation, thereby saving on the cost of data-gathering and processing equipment and on the cost of microwave or leased-wire facilities.**

Two major crude pipeline companies hold this view. A spokesman for one of these firms sees "a very, very

**continued ▶**

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Nalco field man uses specially designed, portable testing equipment for precise measurement of inhibitor concentration at West Texas pumping station.

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4. *FREQUENT PIG RUNS*

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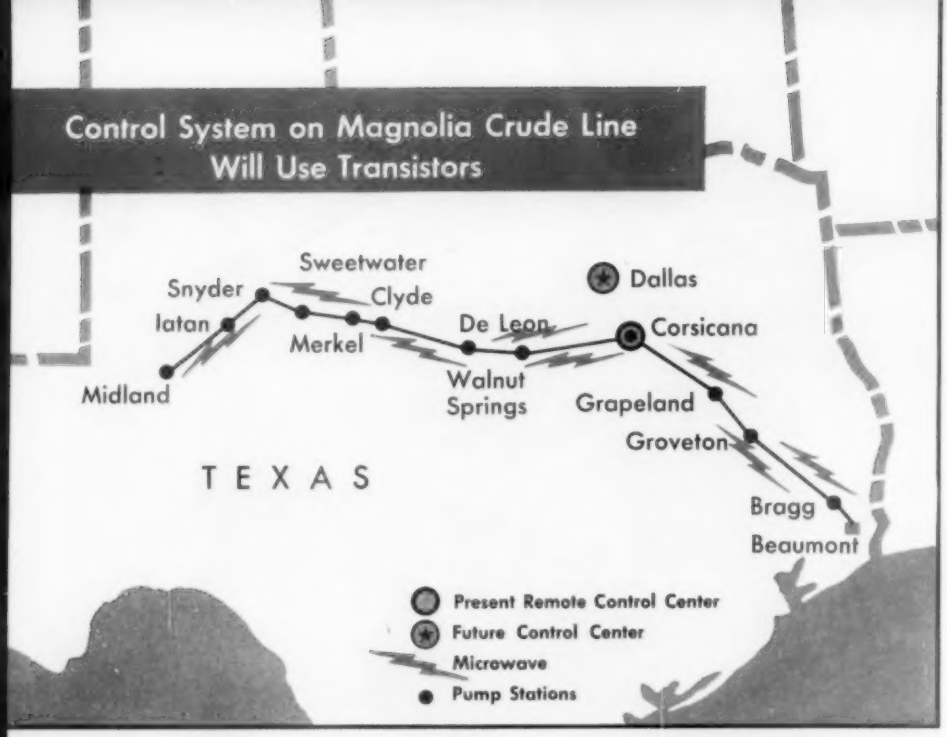
## Control System on Magnolia Crude Line Will Use Transistors




TWELVE STATIONS on Magnolia's Texas crude pipeline will be under remote-control operation from headquarters at Dallas.

real trend toward telemetering only the simple essentials, rather than everything." He notes that it had been the practice to equip a remote station to telemeter such data as motor-bearing and pump-bearing temperatures.

But pipeline people are now beginning to feel that it's unnecessary to know details of this kind. For example, he explains, if there is a hot bearing at a station, the station will telemeter shut-down and lock-out information, which is all central control needs to know it must dispatch a repairman.

Or take the case of a failure that can be remedied from headquarters, such as a power failure. A station that has gone out due to lack of power would telemeter just that information, then automatically reset itself in readiness for the return of power, he points out.

An official of the other company concurs. He contends: "The number of functions that ought to be telemetered to the central control point need not be the ultimate in what can be transmitted according to modern practices. Contrary to earlier thinking, the idea now is to telemeter back only the essential information. In a great many cases, this amounts simply to on-off data and lock-out controls."

**Conversely, a spokesman for a manufacturer of pipeline instrumentation believes that a trend will shape up toward telemetering more data—rather than less—as more companies turn to computers to operate their lines.**

Moreover, he contends, the cost of digital telemetering apparatus is small in proportion to the price of the entire computer-control system. He puts it at "25% to 30%."

He says that to run a crude or products pipeline with conventional remote control, this information has to be known: engine or pump speeds, discharge pressure, suction pressure, and case pressure.

On a gas line, he continues, this data must be telemetered: discharge pressure, discharge temperatures, flow rate, suction temperature, suction pressure, specific gravity of the gas, and engine or compressor speeds.

"As increased consideration is given to analog and digital computer techniques, more operating data will be required for optimum operation of the pipeline," he asserts.

## Solid-State Devices Preferred

**Another question on which there is difference of thinking is whether to use solid-state components or vacuum tubes in a control system. The weight of opinion now appears to favor the former.**

Solid-state components appeared first only 13 years ago. In 1948, Bell Telephone Laboratories developed the first transistors, made out of a specially prepared germanium metal. They provided a then-revolutionary way to control and amplify electrical signals—the principal task that the electronic equipment in a pipeline control system performs.

**The principal advantages cited for solid-state components over tubes are the speed with which they transmit signals, their reliability, and easier maintenance.**

Says the chief engineer of the pipeline subsidiary of one major: "Transistors appeal to us because they are more reliable than tubes and respond more quickly to signals than electric relay switches."

He adds that transistors, in the comparatively short period of time they have been used by the pipeline industry, have proved they have a higher life expectancy than do vacuum tubes.

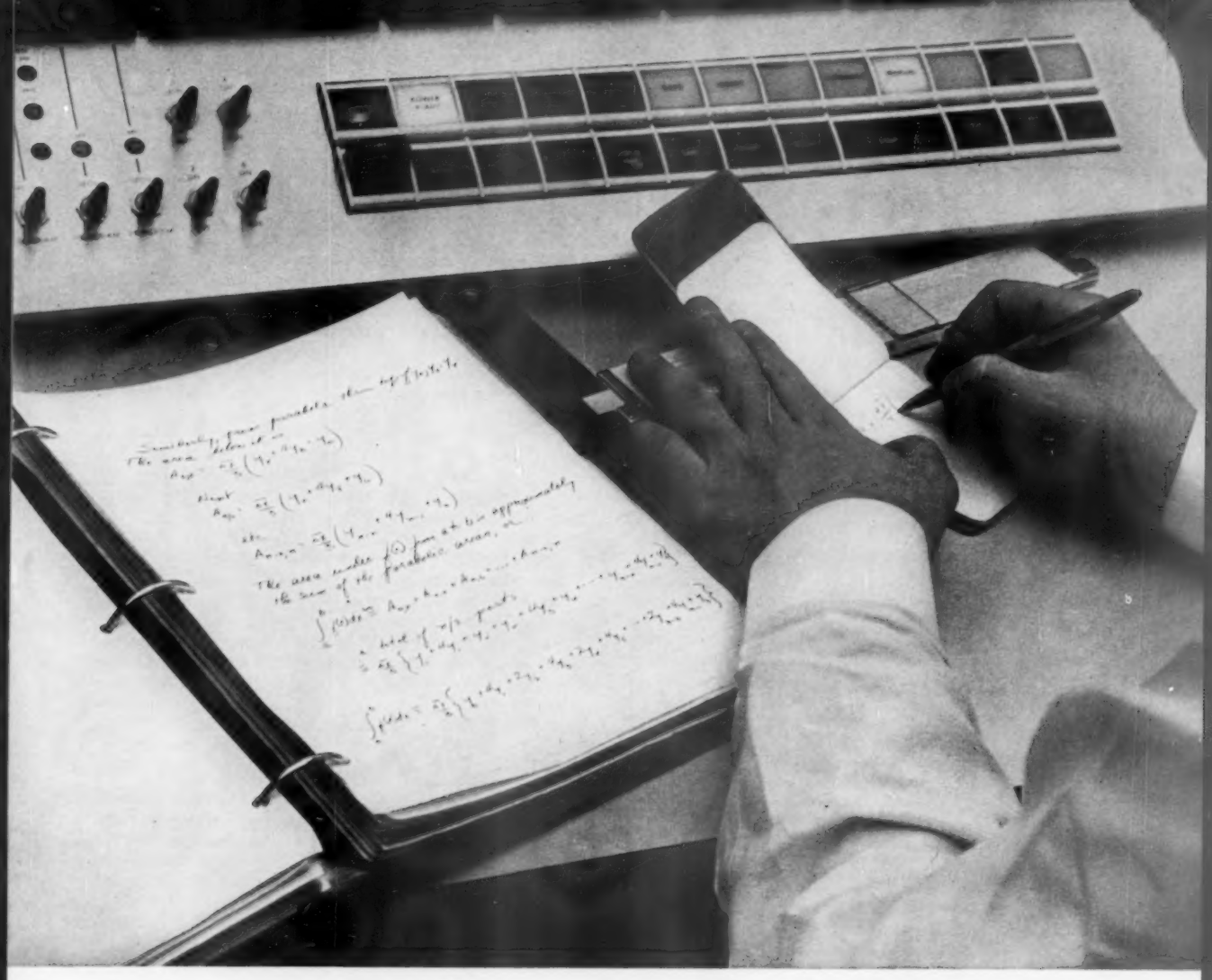
"The big advantage of solid-state controls over vacuum tube equipment is a reduction of outages and maintenance," says another pipeline engineer.

Actually, the claimed merits of greater dependability and less maintenance go together. The reliability (and the presumed longer life) of solid-state devices is due to the fact that they control current without moving parts or heated filaments—factors which, at the same time, can significantly reduce the maintenance burden.

**But not everyone is sold on solid-state components. The main reason given by the skeptics is that the devices haven't been in use long enough to have proven their worth conclusively.**

A pipeline applications engineer for a leading control-

**continued ▸**



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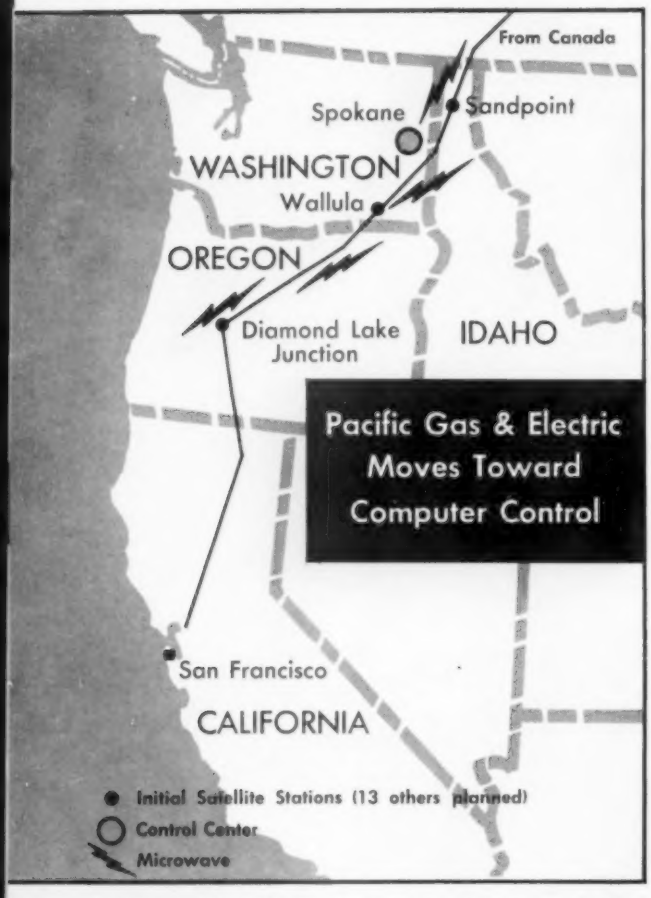


MICROWAVE SYSTEM is going in on West Coast gas line.

instruments company says bluntly: "Solid-state doesn't impress me; it impresses pipeline people, though. We've had tubes working for 20 to 25 years. The business of lower maintenance costs is propaganda for solid-state. Theoretically, solid-state is longer-lived, but not practically."

A colleague of his is noncommittal. He says: "There are still some people who don't put much faith in solid-state components because their history is small in comparison with what we know about tubes. But other people insist on solid-state. And with still others, it doesn't make any difference."

The choice of what kind of equipment to use did make a difference, however, to Standard Oil of California, when it recently had to decide whether to install transistors or vacuum tubes in a control system on its crude pipeline on Alaska's Kenai Peninsula.

Stancal says that it considered solid-state components, adding, "but we didn't dare put in something we felt to be relatively untried so far from civilization."

**A second drawback mentioned by pipeline men is the complexity of solid-state physics, coupled with a scarcity of personnel in pipeline companies trained in the field.**

Laments the chief engineer of one pipeline company: "Obtaining, training, and keeping skilled maintenance personnel has been our No. 1 problem in dealing with transistorized equipment."

Ways have been devised by instrumentation companies to cope with this problem. But none, apparently, has been completely successful.

One has been the introduction of so-called "Cook Book Manuals," which tell a repairman how to spot and correct a failure. Some engineers, however, view the manuals with a certain amount of scorn, complaining that they will not teach you how to comprehend the significance of a malfunction, nor what steps should be taken to prevent its recurrence.

One way of side-stepping the difficulty of a lack of trained people is modular—or plug-in—construction. As its name implies, this kind of construction permits a panel of equipment to be removed in the event the equipment fails, and a working one to be substituted for it. Some pipeline engineers think this is the best way to avoid lengthy shutdowns.

But it has certain disadvantages: First, the panels themselves must be checked periodically to make sure they are sound. Second, maintaining reserve panels hikes costs (though the higher costs, most maintenance people believe, will be offset by reduced downtime). Third, there is a possibility that the plugs, as well as the transistors, may give trouble. On this last point, however, an engineer points out: "A speck of dust . . . will not short-circuit the entire system when signal transmission is on the order of one, two, or three volts."

**Magnolia Pipe Line Co. will use transistors in some of the remote-control facilities being installed on its Texas crude line. Its choice reportedly was dictated by the possibility that ultimately a computer will run the system, at which time equipment of the highest reliability will be required.**

The computer, presumably, would be installed at Dallas, which will be the site of the control center for the remote operation scheduled to be started up in January.

Magnolia's 540 mi. of lines extend from Midland to Beaumont. A section of the system from Corsicana to Beaumont is now being remotely operated from Corsicana (PW—Nov.11'60,p104).

Twelve microwave relay towers and stations are nearing completion on a 335-mi. segment between Midland and Corsicana, which will use solid-state transistors supplied by the SIE Division of Dresser Electronics. The microwave equipment is being supplied and installed by Motorola, Inc.

A company spokesman says the transistors will "lend themselves" to computer control. He adds that "many" intermediate steps are planned before closed-loop control—but won't say what the steps will be.

Meanwhile, a dispatcher at Dallas will direct crude flow through the line, which has a capacity of 235,000 b/d. Under his supervision will be pump or booster stations at Midland, Iatan, Snyder, Sweetwater, Merkel, Clyde, De Leon, Walnut Springs, Corsicana, Grapeland, Groveton, and Bragg.

**Pacific Gas & Electric will use solid-state devices in the 41-station microwave system being installed on its West Coast line** (PW—Feb.24'61,p46).

A spokesman says that potentially lower maintenance costs determined the choice of solid-state.

**continued ▶**

# THERE'S A BIT OF SALT IN THE WIND

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# Computer Control Draws Near

**The most exciting prospect in pipeline automation today is full—or closed-loop—computer control. One engineer puts the time of the installation of the first system as close as three years from now.**

"It is conceivable that, because of the great interest in closed-loop computer control, there may be several large pipeline systems on computer control within the next three to five years," says Jack T. Teed, market manager of the petroleum and chemical industries division of Minneapolis-Honeywell Regulator Co.

Another engineer predicts, however, that it will probably take a decade before full computer control of a pipeline is feasible.

Whichever prediction comes closest to the mark, it is certain that operation of a pipeline system with a computer will be a reality in the not-too-distant future. "The ultimate, of course, is to have computers handling the entire operating function," says a spokesman for a pipeline company. "The ultimate is not yet here, but it is getting ever closer."

**In a closed-loop system, the computer would continually handle all operations, including accounting, dispatching, and control.**

In its accounting function, the computer would forecast demand, and calculate the availability of the crude, products, or gas to fulfill that demand.

In dispatching, it would work out a schedule based on its demand and availability forecasts.

And in control, it would operate the entire pipeline system—controlling flow, pressures, and other functions—in such a way that the schedule it set up would be met.

A. J. Shoup, vice-president and chief engineer of Texas Eastern, envisions such a system. "In its most sophisticated form," he says, "the control system will be completely capable of predicting and controlling the operation of the entire pipeline and all of its related gas supply and sales requirements, taking into account load factors; seasonal, daily, and hourly demand; the availability of gas from other sources in the system; the relative economic advantage of purchasing gas from one field versus another; the considerations of firm versus interruptable load requirements; and many other economic considerations which have heretofore been impossible to incorporate in the minute-to-minute and hour-by-hour operation of any pipeline."

**Pacific Gas & Electric says that in five to ten years, when it will be moving 800-million cf/d, full automatic control will be necessary for optimization of flow.**

As yet, however, the company points out, no computer program has been worked out that is adequate to handle the routing and pressure problems on a pipeline as complex as the one it's building.

The company's initial plans call for installation of three satellite stations—at Sandpoint, Idaho; Wallula, Wash.; and Diamond Lake Junction, Ore.—which will be controlled from Spokane. The Spokane station will receive "orders" from company headquarters at San Francisco, and will also get data on flow from a compressor station in British Columbia.

**One hurdle in the way of building a computer-directed line is the higher cost of digital telemetering equipment as compared with analog equipment, according to one engineer.**

He says that digital telemetering, because it's a more accurate and faster mode of transmission than analog, will have to be used in any closed-loop operation.

He adds, however, that computer control is five years away, and "the cost of digital telemetering is holding it up."

A chief factor in keeping the cost up, apparently, is a lack of standardization. "There's no point in talking about [closed-loop control] until you standardize telemetering to get its price down," he asserts.

The need for standardization was pointed up recently by I. B. Cloessner, Jr., of Humble Pipe Line, at a meeting of the American Institute of Electrical Engineers, when he called for greater standardization of transducer output signals and digital codes (PW—Feb.17'61,p71).

**Engineers say that the accuracy and reliability of digital telemetering equipment will be improved and that this may hasten closed-loop control.**

"As automation continues in the pipeline industry, the use of telemetering will become more and more important," said Cloessner. "Computer control of pipeline systems will become a reality. Telemetering will help to close the loop to the computer. With these additional reliability factors placed on the telemetering equipment, specifications for telemetering equipment will become more rigid."

Cloessner specifically suggested that equipment be made easier to calibrate, and otherwise improved so that it will hold its calibrations better.

Even the people who make digital telemetering apparatus agree that there's a need for improvements. Says one: "The trend now, in preparation for this big step five years from now, is the updating or modernization of instrumentation at metering and compressor station."

**Many pipeline engineers feel that some computers already in existence are capable of directing operation of a line.**

One big instrument manufacturer feels its computer could control any of the large pipeline systems in existence today—whether gas, products, or crude.

The computer is an industrial computer, which means it was designed for industrial functions, such as running a pipeline. And, depending on the complexity of the line, it could also perform secondary accounting and billing jobs as well, the company says.


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# Suboptimization — Computer-Age Problem

**Managers are discovering more and more that good decisions at lower levels often boomerang at the top.**

**Top managers in major oil companies are finding increasingly that decisions that benefit a single unit or division may actually be detrimental to their companies as a whole.**

In recent years, this has become most acutely apparent in the refining segment. In an attempt to reduce unit costs (and thereby increase profits) refinery managers have strived to increase volume.

But the marketing division, which is then confronted with excess supply, must cut its prices to move its product. Because of this, the division may suffer a loss in its own operations.

The effect of these two imbalanced operations is transmitted to the company as a whole.

**Industrial scientists have given this problem a name. They call it suboptimization.**

The name is part of the new terminology that has come to the oil industry through the introduction of operations research.

With the aid of computers, oil companies have adopted O. R. techniques that have enabled them to optimize the efficiency in single plants or in units within plants.

Each such optimization, however, becomes a suboptimization when viewed from the over-all company level.

And unless some adjustment is made in the lower echelons, suboptimization will boomerang at company headquarters.

**In trying to cope with suboptimization, oil companies have taken a look at unified profit planning.**

This approach to financial management calls for elimination within a company of all individual profit centers.

There remains just one single profit center—the company itself.

**Only a handful of oil companies have actually introduced unified profit plans, so there is as yet no clear-cut trend in this direction.**

But wherever the step has been taken, it has tended to take this form:

Most managers are relieved of their responsibility to show black ink on individual profit and loss statements covering their own operations.

Instead, their overriding assignment is to meet specific volume goals—and not to exceed them.

These goals are fit into a single company-wide plan that tends to limit the existence of oversupply in any one sector.

It is significant that advanced computer techniques have emerged that make possible the quick implementation of such plans.

Coupled with their volume goals, the managers are given cost levels to which they must adhere.

The upshot of this approach is that lower management is motivated to reduce unit costs not by the improvement of output but by a more efficient handling of men and resources within a specified volume range.

No profit and loss comparison is drawn up until all accounts are joined together in the company's final statement.

In actual practice, this ideal plan is not used. In one company, for example, production is a separate center.

But in any case, unit management is weaned away from its concentration on profit-and-loss, and the comparison of this year's profits with those of the year before.

Instead the managers apply themselves to the performance levels that have been established through the unified plan. Any variation from these levels is brought to the attention of higher management, and the necessary analysis of the working problems is begun.

**The application of unified planning in the oil industry avoids a common problem—the attempt to balance apparent profits in one segment with losses in another.**

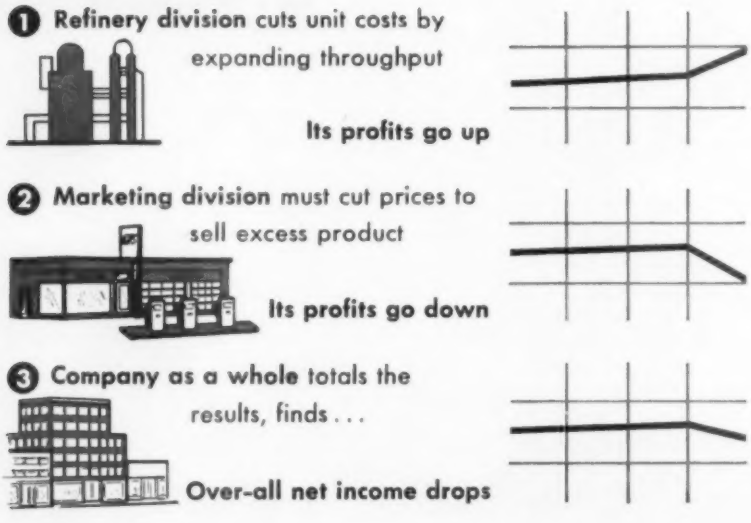
Traditionally, this has taken the form of balancing profits in production with poorer performances in the rest of the industry. But regardless of which segments are compared, there tends to result unjustified intercompany rivalry which interferes with the smooth operation of the company over-all.

"This is a problem that each company must work out for itself," one oil-company executive admitted to PETROLEUM WEEK recently.

Often, this "working out" has entailed some unusual transfers in accounting. In one company, for example, a broad-scale service station painting program was charged off to production not long ago.

But production need not always be the bearer of seemingly inappropriate expenditures.

**SUBOPTIMIZATION:** ***What it is, and how it works.***


1 Refinery division cuts unit costs by expanding throughput
Its profits go up
2 Marketing division must cut prices to sell excess product
Its profits go down
3 Company as a whole totals the results, finds . . .
Over-all net income drops

# for Oil Men

In the same company, the refining department is charged with the costs of operating a few chemical plants that actually belong to a subsidiary company.

**Despite the complications incurred in the industry's traditional approach to profit accounting, many oil men are hesitant to move to a unified system.**

"It would require a full-scale reorganization of our entire company," one executive remarked to PETROLEUM WEEK.

Furthermore there is the feeling among oil men that individual profit and loss statements allow unit managers a great deal of necessary flexibility in running their own operations.

A detailed operation plan such as is required in unified accounting is difficult to follow, especially with the unexpected monthly variations that are often induced by weather.

And furthermore, oil men point out, tax laws and regulatory agencies require profit and loss statements in certain segments of the industry, particularly in transportation.

**But whatever the traditional hesitancies that prevent most companies from accepting unified profit planning, the move is frequently acknowledged as a forward one.**

Says one company spokesman (where the plan has not been introduced): "For such a plan to be considered by an oil company indicates that the petroleum industry is catching up with other industries in forward-looking accounting methods, and therefore no matter what specific unified plans are finally adopted, it cannot but be an indication of greater efficiency in internal accounting control in the future."

## West Coast Major Plugs School Gap

**"They never learned about computers in school, so we try to educate them." That is the reason Standard Oil Co. of California conducts a computer orientation program for employees.**

The training is for all employees in virtually all departments that conceivably can use computers.

Each year, ten to twelve groups are brought to computer headquarters in San Francisco. The orientation sessions may last from three days to two weeks, depending upon the nature of their work and the degree to which computers may be expected to help them. Some actually will be given programming problems to work out on an IBM 7090 computer.

"If they are really getting benefit from the training," says Howard Crandall, head of the computer department, "they'll send in specific problems later for us to solve."

***Edison vs. Einstein:***

# How Sohio Looks at Research

**The competitive success of oil companies over the next 40 years may well depend not on marketing, refining, or production, but on research.**

This vital sector of the industry has emerged to dominate all others—and in the end it may decide which companies are to survive in the rapidly changing future.

**E. B. McConnell, senior vice-president of Standard Oil Co. (Ohio) made this point at the research and utilization conference of the American Gas Assn. this month.**

He raised the question of whether industrial management is looking at research with a modern perspective. And noting that the major achievements of prominent scientists are still largely performed outside of industrial laboratories, he threw a critical glance at the way administrators develop their research programs.

**McConnell claims that the failure of industrial laboratories to match the achievements of academic institutions is due to management's insistence on short-term results.**

"If you had the opportunity to hire an Edison or an Einstein," research administrators were asked recently, "which would you choose?"

The question was posed at a symposium on research administration arranged by the Hay Management Consultants.

Many of the industrial research administrators present chose Edison, McConnell recalled.

But in today's "scientific revolution," says McConnell, it is difficult to mount a research program with the kind of progress that is to come through the practical approach of an Edison.

**What is Sohio doing about research? McConnell says that his company has found it must reappraise its research effort every five to ten years.**

The company's new attitude toward research is best expressed in its revised policy. The emphasis is clearly on basic research, "which has as its purpose the pursuit of innovations outside the present businesses of the company."

**At Sohio's laboratories, the company's researchers are working on some projects for which there may be no practical application.**

One project, for example, is concentrated on the study of the positive and negative charges of the earth's atmosphere.

Knowing that a negative charge of ions in the air furnishes physiological benefits, the researchers managed to impart a negative charge to ordinary automobile exhaust.

This tends naturally to improve the atmosphere, McConnell says, and, incidentally, reduces irritating smog.

"We still don't see how we are to make money from this," he says, "but it has already stimulated some of the advanced thinking in our fuel cell work."

**Timing is a decisive consideration in the selection of research projects.**

"All we can expect from research says McConnell, "is to stay a few years ahead of our competitors."

With the rush of new discoveries and burgeoning outlays for research and development, McConnell confesses that it is difficult to get a commercially feasible result before a competitor does.

Although management still plays a major role in selecting research projects, McConnell says Sohio finds that the setting of research goals by research men themselves stimulates motivation.

Entering its tenth year of service to the industries that produce and distribute natural gas, Transco points with pride to the stability of markets it affords producers, and to the economies of transmission it affords customers. TRANSCO — the pipeline carrying natural gas to the markets where the most people are.

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# Work Starts Soon On West

**West Shore Pipe Line Co. has set June as a starting date for building its $22-million Chicago-Milwaukee-Green Bay (Wis.) products line.**

Ten companies have joined on the Midwest products line in a move to cut transportation costs.

One official says that at first the line will supplement tanker transportation, but that ultimately it may replace ships entirely. It would permit year-around movement of products in an area that is ice-bound most of the winter.

West Shore, originally organized by Pure Oil Co. and Interstate Oil Pipe Line Co. now has as partners American Oil Co., Clark Oil & Refining Corp., Continental Oil Co., Cities Service, Mobil Oil Co., Ohio Oil Co., Shell Oil Co., and Texaco Inc. (PW —Sep.16'60,p45). Interstate is a wholly owned subsidiary of Standard Oil Co. (N. J.)

The pipeline is expected to be completed around Dec. 1, 1961.

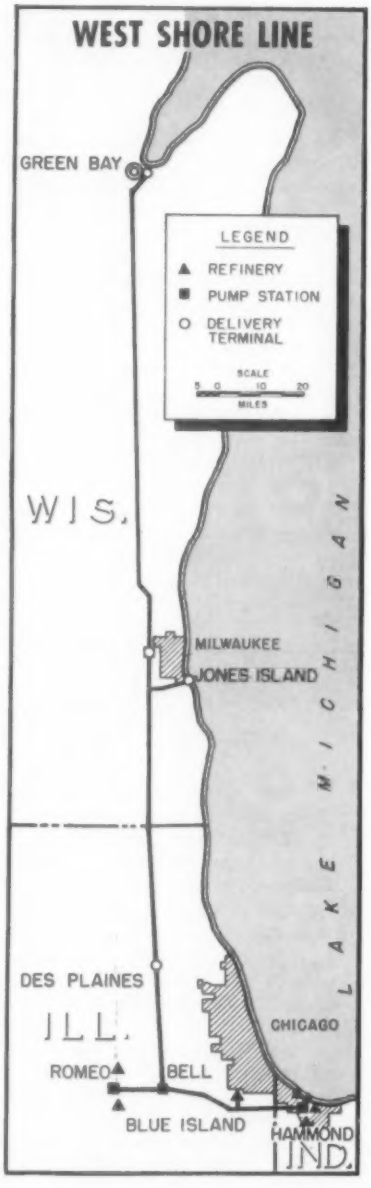
**The 285-mi. system will have an initial capacity of 85,000 b/d, with provisions for future expansion.**

A 16-in. main trunk line will run north from Chicago area refineries through Des Plaines, Ill., to a new terminal site west of Milwaukee (map). A 16-in. lateral will run eastward from the main line to Jones Island in the Milwaukee harbor area, where six terminals are now located.

From the west Milwaukee terminal site, a 10-in. trunk line will be laid north to Green Bay, Wis. Other terminals will be located at Des Plaines and Green Bay. Three receiving points with meters and attendant pumping facilities will be located at Hammond, Ind., and Blue Island and Romeo, Ill., with two trunk line pumping stations. One will be located at Bell, near Chicago, the other west of Milwaukee.

Interstate Oil Pipe Line, Shreveport, will supervise design, engineering, and construction of the line.

**The company still needs approval for the water-area crossings,** and the U.S. Army Corps of Engineers says it will take another week to reach a decision on the line. The district engineers' office says that after all revised applications from the company to cross five navigable water areas—the Chicago Sanitary & Ship Canal, the Indiana Harbor Canal, the Cal-Sag Canal, the Des Plaines River, and the Fox River—are in, it will issue public notices to see if there are any navigational objections to the pipeline.




**In the meantime, a board of directors and officers of the new company were elected last week.**

Named to the board were C. H. Albitz, Texaco Inc., R. L. Grogan, Clark Oil & Refining Corp., P. H. Hunter, Interstate Oil Pipe Line Co., S. L. Jackson, American Oil Co., W. L. Kygar, Continental Pipe Line Co.,

# Shore Line

Ben D. Leuty, Cities Service Pipe Line Co., Jack H. Rice, Marathon Pipeline Co., W. F. Schoenthaler, Shell Oil Co., Fred F. Steingraber, Pure Oil Co., and L. H. True, Magnolia Pipe Line Co.

P. H. Hunter was elected president; W. F. Schoenthaler, vice-president; Fred F. Steingraber, vice-president; A. C. Hutcheson, Pure Oil Co., secretary; R. F. Sturgis, Jr., Pure Oil Co., treasurer; L. V. Dennis, Interstate Oil Pipe Line Co., assistant secretary; S. T. Noell, Pure Oil Co., assistant secretary; C. M. Wright, Shell Oil Co., assistant secretary and assistant treasurer; and Frank R. Clark, Jr., Interstate Oil Pipe Line Co., assistant secretary and assistant treasurer.

Interstate has loaned personnel to West Shore to handle the design and construction of the pipeline. They are Wayne T. Corley, general manager, A. Vernon Cardin, assistant general manager and construction superintendent, D. C. McKinley, project engineer, and L. V. Dennis, manager of claims and rights of way.

# 'Microballoons' Save $250,000

**Standard Oil Co. (Ohio) says it has saved $250,000 a year in the past seven years by using Microballoons to cut crude evaporation loss in its storage tanks.** The evaporation cut amounts to 85%.

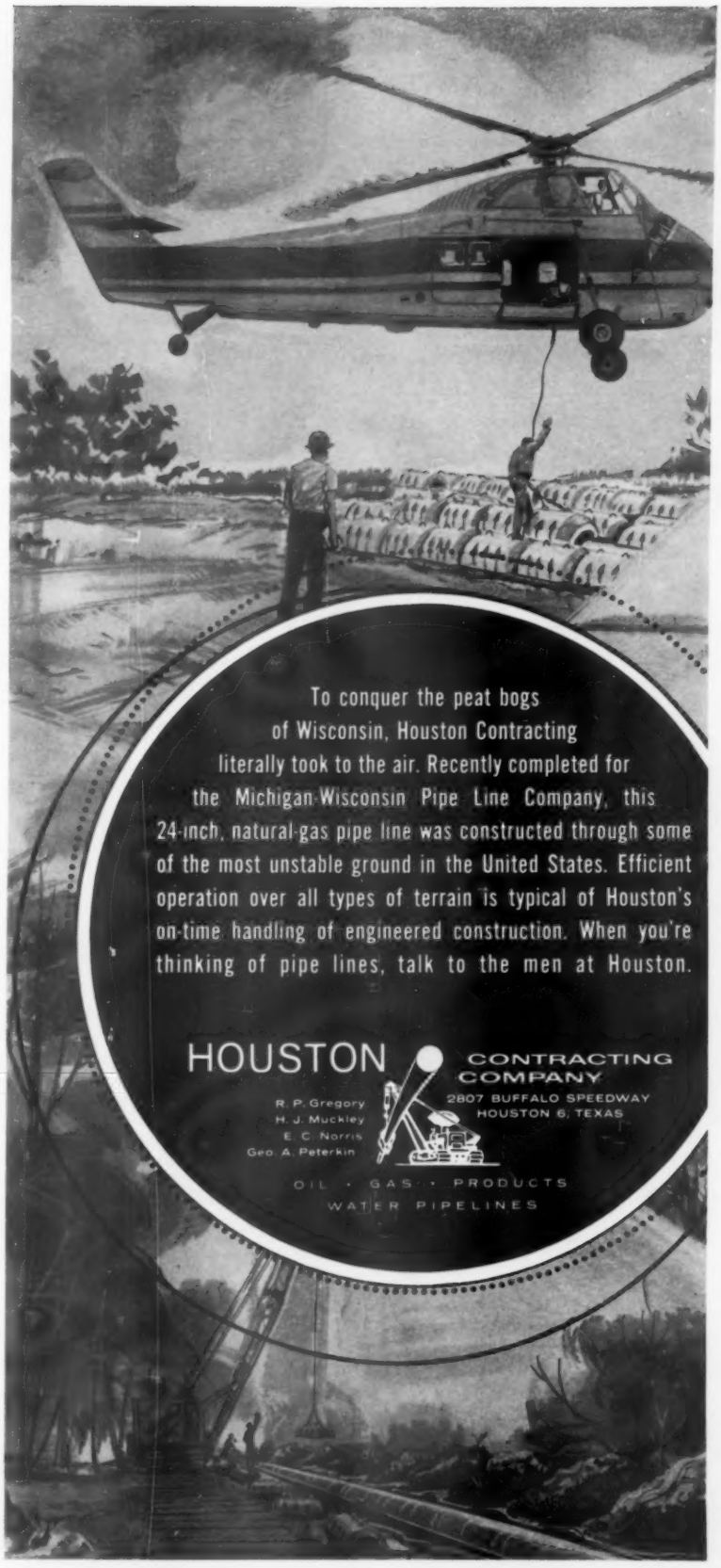
Microballoon particles are used now as a protective plastic foam layer, one-half to one-inch thick, on top of stored crude in more than 400 tank installations—not only in the U.S., but also in Brazil, Turkey, and Indonesia.

According to Sohio's John M. Dempster, Jr., at the annual meeting of the Western Petroleum Refiners Assn. in San Antonio, the payout period on the Microballoons is often less than one year, and the life of the material is 20 years or more.

**Microballoons—developed by Sohio—are tiny, hole-free microscopic bubbles of urea-formaldehyde or phenolic resin, filled with inert gas.**

The average particle size of the bubble is approximately 50 microns in diameter—or some 800 times smaller in diameter than a ping pong ball.

These tiny bubbles are floated on


To conquer the peat bogs
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crude in a ½- to 1-in.-thick layer and create a vapor impenetrable foam. The specific particles were made small enough to pack together, Sohio says, so that the capillary spaces between spheres would be minimized, and the spheres would be light enough to float on the surface of the petroleum and petroleum products.

In crude services, Dempster pointed out, the spaces between individual Microballons become choked with the higher boiling components of the crude and this greatly reduces evaporation.

# Oil's Microwave Use Will Double

**The amount of microwave facilities used by the petroleum industry will double within the next six to eight years. That's the prediction of a Washington attorney,** specializing in communications.

Joseph E. Keller, counsel for the Petroleum Industry Electrical Assn. told the 33rd annual conference and exhibition of that association and the Petroleum Electrical Supply Assn. at Galveston, Tex., last week that demand for microwave facilities is growing at the rate of 15% yearly. Keller added that the petroleum industry's investment in microwave facilities alone totals $35-million.

**He said the Federal Communications Commission is finalizing permanent rules for microwave use by the petroleum industry.**

Keller predicted that these permanent rules should be completed and in effect by "the end of this summer." He said the PIEA has been striving for permanent rules for some time. Permanent rules will provide five-year licenses for petroleum microwave users. This means that the microwave user will have freedom to employ the facilities for an extended period without fear of losing the wave band assigned to him.

"This is a great victory for the petroleum industry, which is the biggest user of microwave," he added.

**At the same time, the attorney hit the American Telephone & Telegraph Co. by saying that the company is always "preoccupied with other peoples' properties."**

Keller said AT&T had requested that the FCC grant permission to send an experimental communications satellite into orbit. "The only drawback was that they simply wanted a portion of the wave bands assigned to the petroleum industry."

The project was rejected, he said. But he pointed out that AT&T had been granted a "Telpak" tariff, which is directly competitive with private microwave use. He said that under this tariff, AT&T offers a "cheaper-by-the-dozen" type of communication system. The company can now offer up to 240 bands at wholesale prices.

Keller warned members to look carefully at this type of proposal before abandoning their own microwave facilities. He said the time may come when "you may need your own communications facilities and they may not be available."

**Vast improvement—and lower costs—were predicted in microwave equipment.**

Keller said that fully transistorized equipment, requiring less maintenance, will be more competitive with the Telpak.

**One way of getting the communications job done at low cost is by using an existing leased telephone system.**

E. B. Stephenson, Continental Oil Co., said Conoco's Yellowstone Pipe Line has this kind of system.

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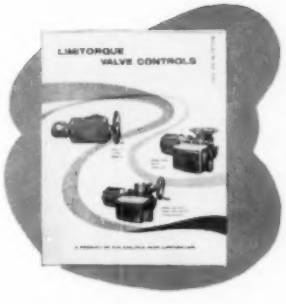


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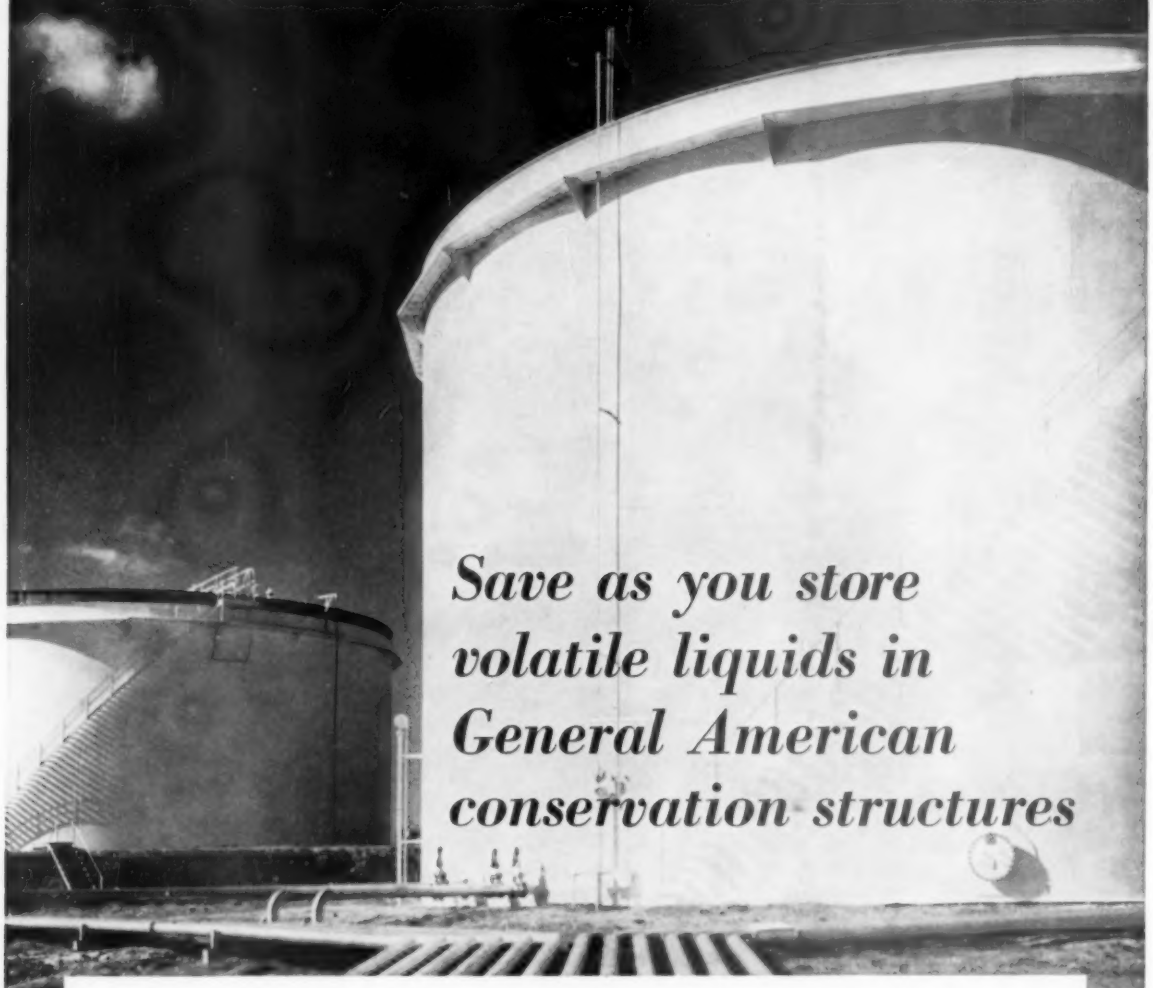

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# Simpler Controls Are Needed

**Pipeline automatic-control equipment should be designed so that it can be serviced by nontechnical personnel,** according to W. M. Osborne, of Shell Oil Co.

Osborne made the recommendation in a panel discussion at last week's meeting of the Petroleum Industry Electrical Assn. and the Petroleum Electric Supply Assn., at Galveston.

"Many pipeline companies have men who have given many years to the operation of pipeline pumps," he pointed out. "These men can and should be used in the capacity of nontechnical maintenance people to the full extent of the needs of the pipeline system. This practice is economically sound and operationally practical."

The equipment should be so designed, Osborne added, that these maintenance men can spot difficulties easily and then correct them, or call a skilled mechanic to make the repairs.

**Osborne indicated that more local-station automation, instead of a higher degree of remote control, might be a way of achieving greater simplicity in pipeline control.**

Some remote-control systems provide for the transmission of too much detail regarding maintenance and record-keeping, Osborne said, thereby limiting the number of remote installations an operator can handle.

In addition, he explained, as more information is transmitted, the cost of the telemetering system increases. He suggested that it might be more practical to spend the money that would go for telemetering apparatus on station-level automation.

**Another advantage listed for an automatic station is that its operation is not dependent on a communications system as is the operation of a remote-control station.**

"A system that requires close attention of the remote operator for each individual station to operate safely cannot operate when communications fail," he said. "A station that operates automatically on its own controls can continue to operate for a time during such outages."

## Turnagain Crossing To Be Tried Again

**A pipe-laying barge is en route from Louisiana to Alaska, where another attempt will be made to install dual pipelines under Turnagain Arm to bring gas from the Kenai Peninsula to Anchorage.**

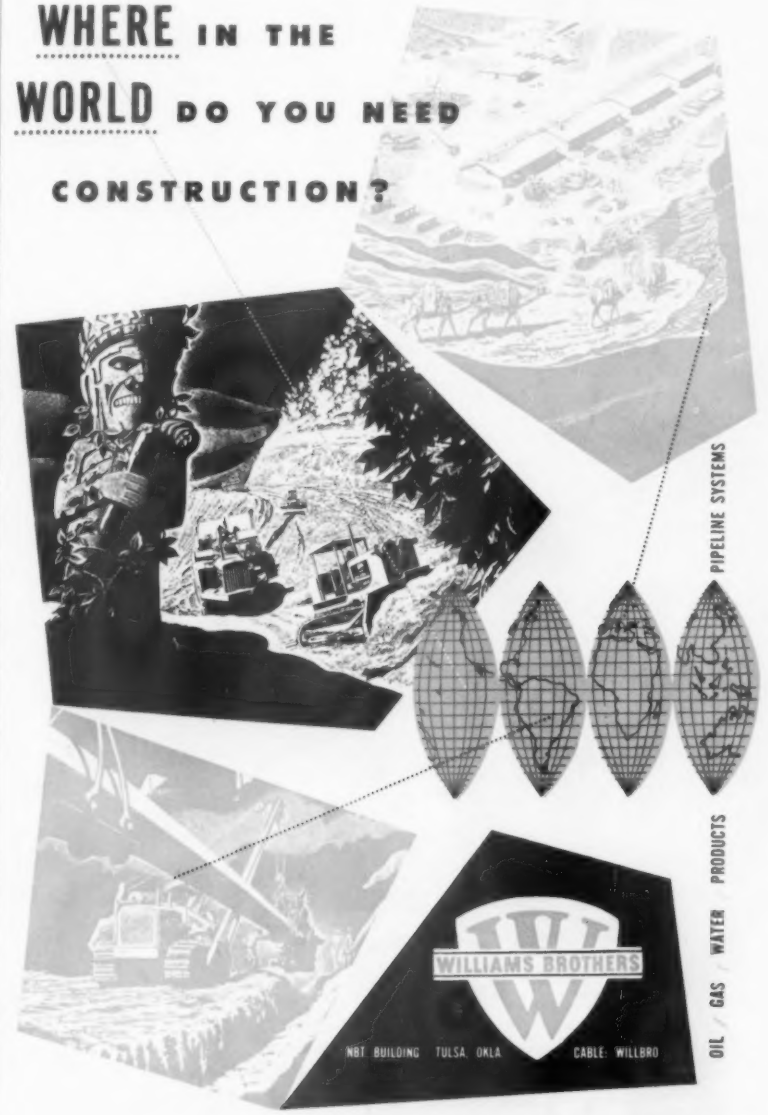
Work on the crossing had to be halted last year because of roiling waters and tides of 35 ft. in the 8½-mi.-wide arm of water, plus the discovery of two unmarked channels (PW—Oct. 21'60,p87).

The section of the line on the Peninsula, which originates at wells of Union Oil Co. of California and Ohio Oil Co., is virtually complete, and a grid in Anchorage is complete.

The 165-mi. line is being built for Alaska Pipeline Co.

The 240-ft. barge, Tidelands, built for laying big-inch pipe in the Gulf of Mexico and other coastal waters, is now in Seattle, together with a service barge.

After loading additional equipment, the barges will be towed to Alaska, where operations will begin next month.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# What's New / IN PIPELINES, TANKERS, STORAGE

**Belle Fourche Pipeline Co. is building a 12-mi. crude pipeline from the Fiddler Creek station to the Osage station of Butte Pipeline Co., in northeast Wyoming.**

In authorizing the 8⅝-in. line, the state's Public Service Commission said it would fill a need for pipeline facilities in that part of the state.

Meanwhile, the PSC has granted a request by the Plains Pipeline Division of Franklin County Coal Corp. to hold in abeyance for six months its application to build a line from Fiddler Creek southward to Lance Creek (PW—Mar.24'61,p36).

The 70-mi., 10-in. line would supplement an existing line of Plains Pipeline.

•

**The Federal Power Commission last week O.K.'d $5.5-million worth of budget-type construction proposals of Cities Service Gas Co. and Trunkline Gas Co.**

Both want to take new supplies of natural gas into their pipeline systems. Cities Service will spend $3-million, and Trunkline, $2.5-million, with no single project by either company costing more than $500,000.

•

**Texas Eastern Transmission Corp. is constructing two new underground storage facilities for LPG**—one at Mont Belvieu, Tex., with a capacity of 20-million gal., and the other at Todhunter, Ohio, with a capacity of 16-million gal. Total cost will be $3-million.

•

**Efforts to move large volumes of Alberta condensate into the Chicago area open the exempt status of Canadian crude to review,** Rudy J. Munzer, president of the Liquefied Petroleum Gas Assn., told PETROLEUM WEEK last week.

Munzer referred specifically to plans to export 70,000 b/d, approximately the volume proposed to be moved by Pembina Pipe Line, Ltd., and Standard Oil Co. (Ind.), if their pipeline plan is approved (PW—Oct.21'60, p86).

He said there is a feeling among U.S. producers that such plans conflict with the intent of the quota system.

•

## Engineering

**A circular slide-rule calculator is now available that tells corrosion engineers how much pipeline outer wrap is needed for a job and the total cost of materials.**

The free calculator, which has a diameter of 6½-in., can be obtained from T. J. Kelly, Owens-Corning Fiberglas Corp., Toledo, Midwestern Pipe Line Co., Tulsa or Perrault Supply, Tulsa.

•

**The SIE Division of Dresser Electronics has published a sixty-page booklet explaining pipeline automation principles.**

This first volume of a series, titled "The ABC's of Industrial Telemetering," is available from SIE, P.O. Box 22187, Houston 27, Tex.


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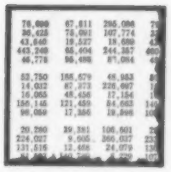
# The Market  Trend

**PETROLEUM WEEK**

April 21, 1961

## A Dollop of Kuwait, A Pinch of Arabian

**If your computer isn't busy this morning, give it a whirl on the price of Parentis crude.** We're led to believe that this unpublished number is $2.85 a bbl., f.o.b. Ambes, France. Your answer may be different.

**The Parentis crude price is set by a complicated formula.** It's almost in the realm of higher mathematics. And as an example of what bureaucrats can do in a controlled economy, it speaks worlds.

**First you build up an f.o.b. element for Parentis by a look at competing areas of supply.** It's almost like a cake recipe. Take 44% of the price of Kirkuk ($2.21) at Banias. Add 41% of the price of Kuwait ($1.59) at Mina-al-Ahmadi. Then throw in 15% of the price of Arabian ($1.80) at Ras Tanura.

**Then you adjust for the low-sulfur quality of Parentis.** Just add 30¢.

**Now you're ready for the freight element.** Taking USMC flat rates to Le Havre, use 33% of the rate from Tripoli, 41% of the rate from Kuwait, and 15% from Ras Tanura. This ought to be $1.17 a bbl.

**You're not finished with the freight so easily.** Take two-thirds of $1.17 and you get 78¢. From 78¢, subtract 25¢ of freight from Bordeaux to Le Havre. You then convert the 53¢ balance from USMC rates to AFRA rates and get 46¢.

**But you're getting close.** Now take the remaining third of $1.17 at the break-even point for Ras Tanura to Sidon (USMC minus 49%), and you should get 20¢ a bbl.

**Now you're in the home stretch.** Take $1.89, plus 30¢, plus 46¢, plus 20¢. And you ought to get $2.85.

**And one more thing.** If the next time you figure this out, and the difference is less than 5¢, just forget it. Changes less than 5¢ a bbl. aren't worth bothering with.

**If you've mastered Parentis, you can then graduate to Gabon.** This African crude is based on Parentis, Iraq, Kuwait, and Arabian, plus two-thirds long-term AFRA and one-third break-even freight from Ras Tanura to Sidon.

**Piping Rock Sold:** Esso is buying a retail fuel oil business on Long Island, Piping Rock Fuel of Huntington. The annual retail volume is approximately 7-million gal.

**Avgas Below 13c:** The military got lots of avgas offered cheap last week. On Grade 115/145 alone, refiners offered over 200-million gal. below 13¢. Shell at Houston looked low at 12.77¢. Close runners included Texas City Refining at 12.83¢, and Cities Service at 12.899¢, Lake Charles.

# The Market Place

## AROUND THE WORLD

Current key crude and product prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service, a McGraw-Hill Publication.

**All prices as of April 17**

**Bold face type indicates changes from previous week**

### KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

#### Western Hemisphere

**U.S. Gulf Coast, cargoes**
- Gasoline, 98 oct prem....11.75-13.25
- Gasoline, 92 oct reg....10.75-11.5
- Kerosine....9.625-10.75
- Heating oil, No. 2....9-10
- Gas oil, 48-52, d.i....9.25-9.75
- Fuel oil, bunker "C"....$2.20-2.40

**Caribbean, cargoes**
- Avgas, Grade 100/130....14.75
- Gasoline, 93 oct research prem....10.875
- Gasoline, 87 oct research reg....9.5
- Gasoline, 80 oct research....8.75
- **Gasoline, 70-72 oct motor method..Withdrawn**
- Kerosine....9.875
- Heating oil, No. 2....8.625
- Gas oil, 48-52 d.i....8.875
- Fuel oil, bunker "C"....$2.00

**New York Harbor, barges**
- Kerosine....10.95-11.4
- Heating oil, No. 2....9.95-10.4
- Fuel oil, No. 6....$2.62

**Okla.-Group 3, northern shpt., bulk**
- Gasoline, 91 oct reg....12.5-13.25
- Kerosine....10.375-10.625
- Heating oil, No. 2....9-9.25
- **Fuel oil, No. 6....$1.60↓-1.90**

**Chicago, bulk**
- Gasoline, 92 oct reg....11.5-12
- Heating oil, No. 2....9.5-11.35
- **Fuel oil, No. 6 high sulfur....7.4↓**

**Los Angeles, rack**
- Gasoline, 88 oct reg....10.8-12.65
- Diesel fuel, PS 200....7.75-11.25
- Light fuel, PS 300....$2.90
- Heavy fuel, PS 400....$2.10-2.45

**Natural Gasoline, Grade 26-70**
- FOB Group 3....4.5
- FOB Breckenridge, Tex....4

**LP-Gas**
- Propane, Oklahoma (Group 3)....3.5-4
- Propane, Baton Rouge....4.625

**Pennsylvania Lubes**
- Bright stock, 25 p.t....26
- 200 vis. neutral, 25 p.t....28

**Mid-Continent Lubes, Tulsa basis**
- Bright stock, solvent, 95 v.i....26-27
- Neutral solvent, 200-210 vis....23-24

**Gulf Coast Lubes**
- Bright stock, solvent, 95 v.i....26-27
- Neutral, solvent, 200 vis....23-24

#### Eastern Hemisphere

**Singapore (Pulau Bukom) cargoes**
- Avgas, grade 100/130....15.75
- Gasoline, 79 oct research....9
- Kerosine....9.75
- Gas oil, 48 d.i. minimum....9

### KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

#### Western Hemisphere

**United States (at the well)**
- Mid-Continent, (Okla.-Kan.), 36.0-36.9....$2.69-2.97
- North Dakota, 36.0-36.9....2.47-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9....3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9....2.92-3.22
  - West Texas, sweet, 36.0-36.9....3.00
  - West Texas, N.M., inter., 36.0-36.9....2.93
  - West Texas, N.M., sour, 32.0-32.9....2.71-2.85
  - East Texas, flat....3.05-3.25
  - Mirando, 28.0-28.9....2.96-3.31
- Illinois Basin, flat....3.00
- Pennsylvania Grade, Bradford dist., flat....4.80
- California, Signal Hill, 21.0-21.9....2.33†
- North Louisiana-Arkansas, 36.0-36.9....2.72-3.02
- Wyoming, sweet, 36.0-36.9....2.85-2.90
- Wyoming, sour, 32.0-32.9....2.63-2.71

**Canada (flat prices, at the well)**
- Pembina (Alta.)....$2.38
- Leduc-Woodbend (Alta.)....2.53
- Redwater (Alta.)....2.42
- Steelman A (Sask.)....2.425
- Virden (Man.)....2.285

**Venezuela (Cargoes, FOB lifting port designated)**
- San Joaquin, 41.0-41.9, Puerto la Cruz....$3.10
- Oficina, 35.0-35.9, Puerto la Cruz....2.80
- Tia Juana, Medium, 26.0-26.9, Amuay....2.30
- Bachaquero, flat, La Salina....1.85
- Lagomar, 31.0-31.9, Cardon....2.55
- Lagunillas Heavy, flat, La Salina....2.07

*†Differential per deg. of grav. varies*

#### Eastern Hemisphere

**Middle East, Persian Gulf (Cargoes, FOB lifting port)**
- Arabia, 34.0-34.9, Ras Tanura....$1.80
- Safaniya, 27.0-27.9, Ras Tanura....1.47
- Iran, 34.0-34.9, Bandar Mashur....1.78
- Iran, 34.0-34.9, Abadan....1.73
- Iraq, 35.0-35.9, Fao....1.72
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.59
- Qatar, 41.0-41.9, Umm Said....1.95
- N. Zone, Burghan, 23.5-24.4, Mina Saud....1.48
- N. Zone, Ratawi, 23.5-24.4, Mina Saud....1.41
- N. Zone, Eocene, 16.5-17.4, Mina Saud....1.28

**Middle East, Eastern Mediterranean**
- Arabia, 34.0-34.9, Sidon....$2.17
- Iraq, 36.0-36.9, Tripoli, Banias....2.21

**North Africa, Bougie, Algeria**
- Hassi Messaoud, 40 and above....$2.65

### KEY TANKER RATES

(Last paid, per long ton, single voyage)

- U.S. Gulf-New York, clean....(ATRS—27½%) $2.07
- U.S. Gulf-New York, dirty....(ATRS—30%) $2.00
- NWI-USNH, dirty....(ATRS—60%) $1.10
- **NWI-UK/Cont., dirty....(Scale—60%) 13/1*†**
- Persian Gulf-UK/Cont., dirty....(Scale—52½%) 29/6*
- Persian Gulf-USNH, dirty....(USMC—65%) $4.45

**Sterling*

# Additives Make Refining More Flexible

**Additives are becoming ever more valuable in oil refineries: They give refiners a wide choice of ways to adjust operations, making them both more flexible and more economical.**

An almost endless list of additives is used in refineries today. Antiknock compounds, gum and rust inhibitors, and combustion-deposit preventers are put into gasolines. Viscosity-index improvers, pour-point depressants, antioxidants, and dispersion and detergent additives have become indispensable for lubricants.

The use of these additives is governed largely by economics: By using them, refiners can obtain for their products certain quality characteristics that could be obtained only—if at all—by much more expensive refining processing.

At the Western Petroleum Refiners Assn. meeting in San Antonio last week, the importance that certain of these additives have on aiding refinery operation was discussed.

**Most additives may be considered as refinery aids, but certain of them are used more specifically to alter the composition of important refinery products. One of these is a new type of pour depressant for middle distillates.**

H. E. Deen, of Esso Research & Engineering Co., described the different ways in which these pour depressants may help a producer of heating oils, jet fuels, and diesel oils to adjust his production to seasonal and other variations that occur in market demand.

The streams that are blended today to produce a typical heating oil, Deen said, include kerosine, virgin distillate, light and heavy cat-cracked distillates, and sometimes thermally cracked distillate.

**By using pour depressant additives to bring the heating oil to specification, a refiner can avoid using as many as three other, more expensive methods.**

Without the use of the additive, Deen explained, the refiner would have to do one or more of the following things to reach the desired pour point for his heating oil:

- Cut the end point of his blending streams to 600F maximum, and direct the higher fraction—from 600F to about 650F—to less desirable uses.
- Blend more expensive stocks very carefully, to the specified pour point (about —10F).
- Add a substantial quantity of kerosine to the final blend.

Because of economic factors, Deen added, a trend is developing toward mixtures of straight-run and cracked stocks for making diesel fuel (instead of using straight-run-distillates only). Thus, the use of a middle distillate pour depressant in diesel fuel may also grow.

**By using these pour depressants, not only do the refiners avoid wasting valuable components; they also maintain a better balance of their products, more in line with the market demand,** the Esso Research speaker pointed out.

For example, he said, last winter many refiners increased their crude throughput to meet the demand for more No. 2 heating oil. This, unfortunately, added more gasoline to already high inventories.

But refiners who used pour depressant additives were able to increase their middle distillate production and decrease their gasoline production with the same crude throughput. They simply added to their No. 2 heating oil blend some medium cat cracked distillates with higher end point.

More specifically, such a refiner can:

(1) Maintain the same crude throughput;

(2) Decrease his gasoline production by 6% by diverting some cat cracker feedstock to his heating oil;

(3) Increase his heating oil production by 23% by the same process; and

(4) Reduce his production of residual fuel oil by 10%, as a result.

**These pour depressants are not the old-type materials that refiners used to prepare on the spot, nor are they the usual pour depressants for lube oils. They are polyesters designed especially for middle distillates,** Deen said.

These additives, like those used in lube oils, work by modifying the temperature at which the wax content in the distillate begins to crystallize, as well as the structure of the crystals.

But a much smaller concentration of these additives is required to obtain the same result than either the lube oil pour depressant or kerosine.

It is not possible to predict the effect of these additives in given streams; they must be tried out and evaluated, Deen explained.

**Another type of additive is used in refineries as a dewaxing aid, to supplement the action of conventional dewaxing processes for lubricating oils.**

"These dewaxing aids," Deen said, "have in many cases significantly improved the economics of dewaxing processes, which are by far the most expensive of lube oil processing steps." They have been effective in both MEK and propane solvent dewaxing, as well as in conventional plate-and-frame dewaxing operations without a solvent.

They can be applied to all sorts of neutral stocks or bright stocks; the amount of additive required varies for each stock. But an optimum additive

## Where Butane Removes Salt From Sea Water

**The U.S. Office of Saline Water is trying out in Tampa Bay, Fla., a freezing process, using liquid butane, to convert sea water into fresh, potable water. It was developed by Cornell's Dr. H. F. Weigandt, and Blaw-Knox Co. (PW—Dec.16'60,p37). The melter tower (above) washes out the briny slush.**

**NO SHARP EDGES**

One look at HOUDRY KAOSPHERES —Houdry Mineral Kaolin Cracking Catalyst in spherical form—shows why this advanced configuration reduces catalyst losses and minimizes erosion of equipment. There are no sharp edges to be knocked off and lost in the form of fines. And accordingly, there is far less erosive effect on processingequipment. KAOSPHERES are fully proved in commercial use, as are the full range of catalysts HOUDRY offers petroleum, petrochemical, and chemical processors. Intimate knowledge of catalysts is in every service, process and product HOUDRY offers.

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concentration exists for each stock processed, Esso Research found.

**The advantages a refiner derives from using these dewaxing aids are many, and their cost is reasonable,** Deen said. Among the improvements he cited:

- An increased filter rate.
- A higher yield of dewaxed oil.
- A lower oil content in the wax.
- A lower solvent dilution ratio.

Refiners who have reported on the benefits they obtain with dewaxing additives indicate increased throughputs varying from 5% to as much as 20%, lower pour points, and generally better quality of both the oil and the wax. The costs reported vary from 2.5¢ to 12.5¢ per bbl. treated.

**The economics of a refinery are instrumental in deciding which antiknock compound should be used in any specific case,** W. W. Sabin and C. J. Wolf, of Ethyl Corp., told the WPRA meeting.

Recent introduction of new antiknock compounds, they said, gives refiners a choice among nine (or more) antiknock additives, which, singly or in combination, may best take advantage of gasoline blending stocks.

Careful study of each particular case may lead to the use of tetraethyl lead (TEL) (which, they said, will probably continue to offer the broadest over-all response), tetramethyl lead (TML), mixtures of TEL and TML, or mixtures of various other lead alkyls.

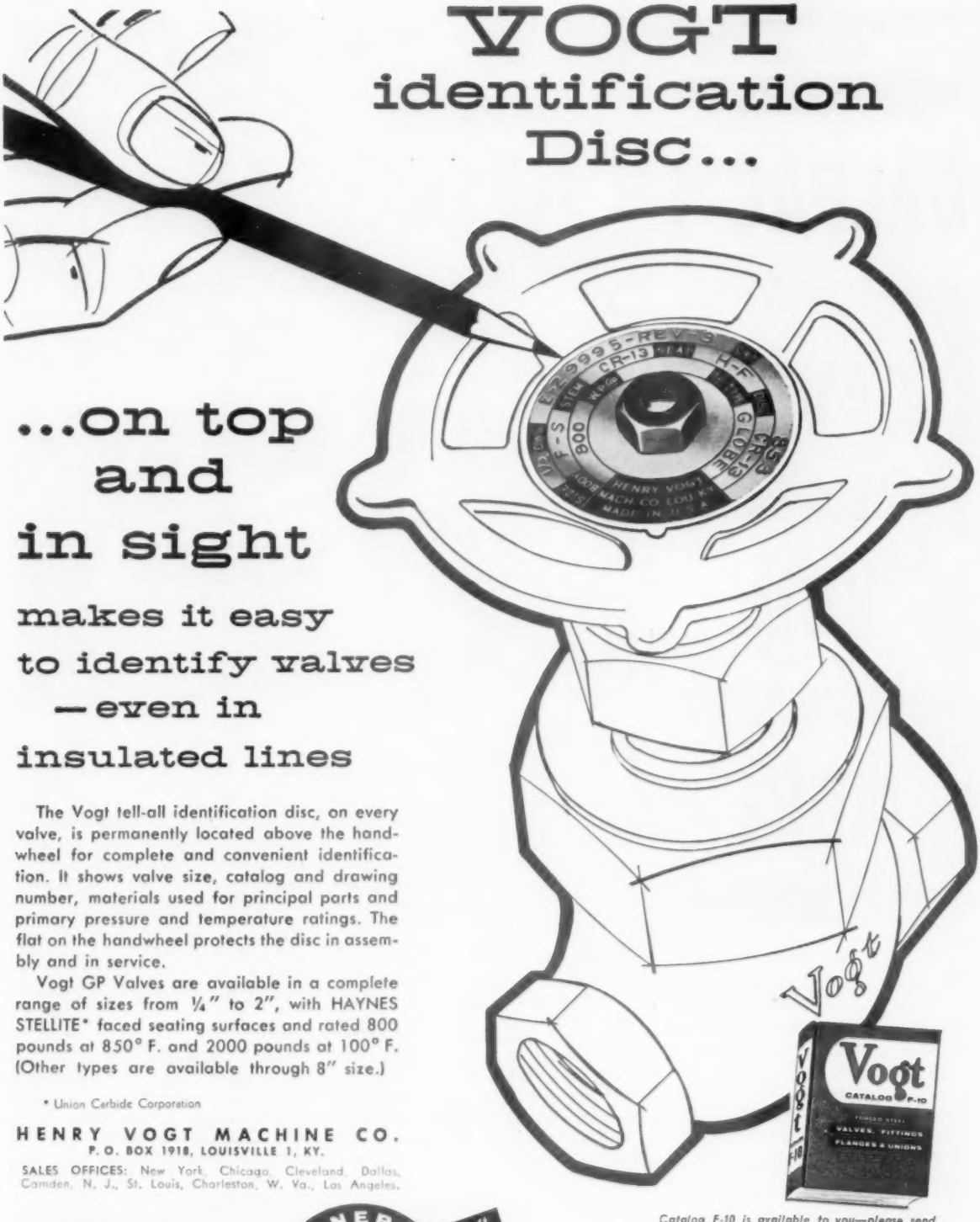
**Refiners must always realize that additives used as refinery aids have secondary effects, and that these may be drawbacks,** the WPRA speakers pointed out.

In the case of antiknock compounds, the secondary effects are well-known: toxicity, combustion chamber deposits, and spark plug fouling. Gum inhibitors sometimes cause carburetor deposits, and some viscosity-index improvers may undergo "shear breakdown," which may cause the lubricant to lose some of its viscosity.

The use of middle distillate pour depressant additives may result in one advantageous secondary effect: Because of the higher boiling point permissible, the heat value of the product may be increased. This, Deen pointed out, may be quite important when the distillate is used as railroad diesel fuel.

On the other hand, oxidation stability, residual carbon, and cetane number may be adversely affected when higher-end-point fractions are added to the product. And wax-crystal modifiers, used as dewaxing aids, may sometimes darken the wax.

# VOGT identification Disc...

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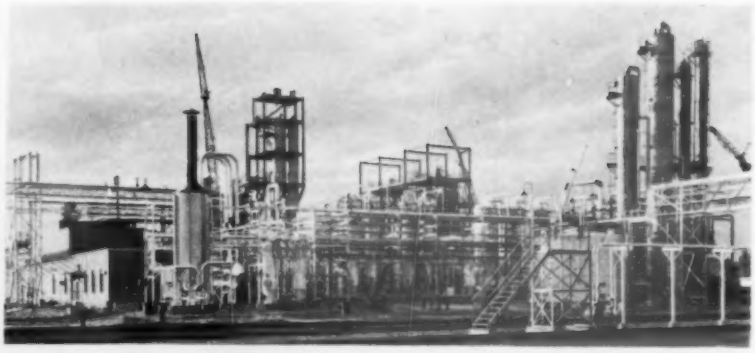
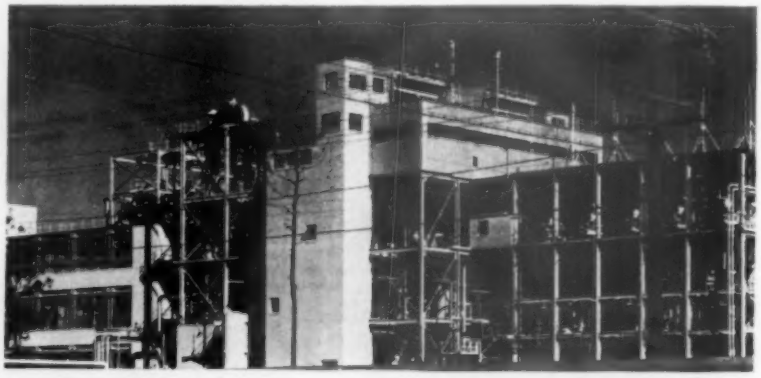


**TWO MORE POLYPROPYLENE PLANTS** are now on stream. The Longview (Tex.) plant of Tennessee Eastman Co. (above) gets its raw material from the East Texas oilfields; the Lake Charles (La.) plant of Hercules Power Co. (below) from nearby Petroleum Chemicals, Inc. The capacity of the Hercules plant will soon be doubled.



# Polypropylene Capacity Grows

**Polypropylene production capacity in the U.S. has been significantly boosted within the past few weeks, as two new plants went on stream—one for Tennessee Eastman Co. at Longview, Tex., and one for Hercules Powder Co., at Lake Charles, La.**

The Longview plant has an initial annual capacity of 20-million lb., the Lake Charles plant, 60-million lb. But an expansion at Lake Charles is already under construction to double that capacity, and Eastman also talks about a second plant, to make the plastic by a slightly different method.

Hercules was the first commercial producer of polypropylene in the U.S.: Its Parlin (N.J.) plant has been making polyolefins since 1955, polypropylene since 1957.

**Total U.S. polypropylene capacity is scheduled to reach 460-million lb. by the end of next year, with an increasing number of manufacturers entering the field.** Besides Hercules, Eastman, Humble Oil & Refining Co., and AviSun Corp. (the joint venture of Sun Oil Co. and American Viscose Corp), several newcomers are building polypropylene plants. Among them: Shell Chemical Co., Firestone Tire & Rubber Co., Dow Chemical Co., and the U.S. affiliate of Montecatini S.A.

**Abroad, polypropylene plants are also being built at a rapid pace,** and foreign production is expected to reach 400-million within the next two years. There will be plants in Canada, Japan, and at least seven European countries.

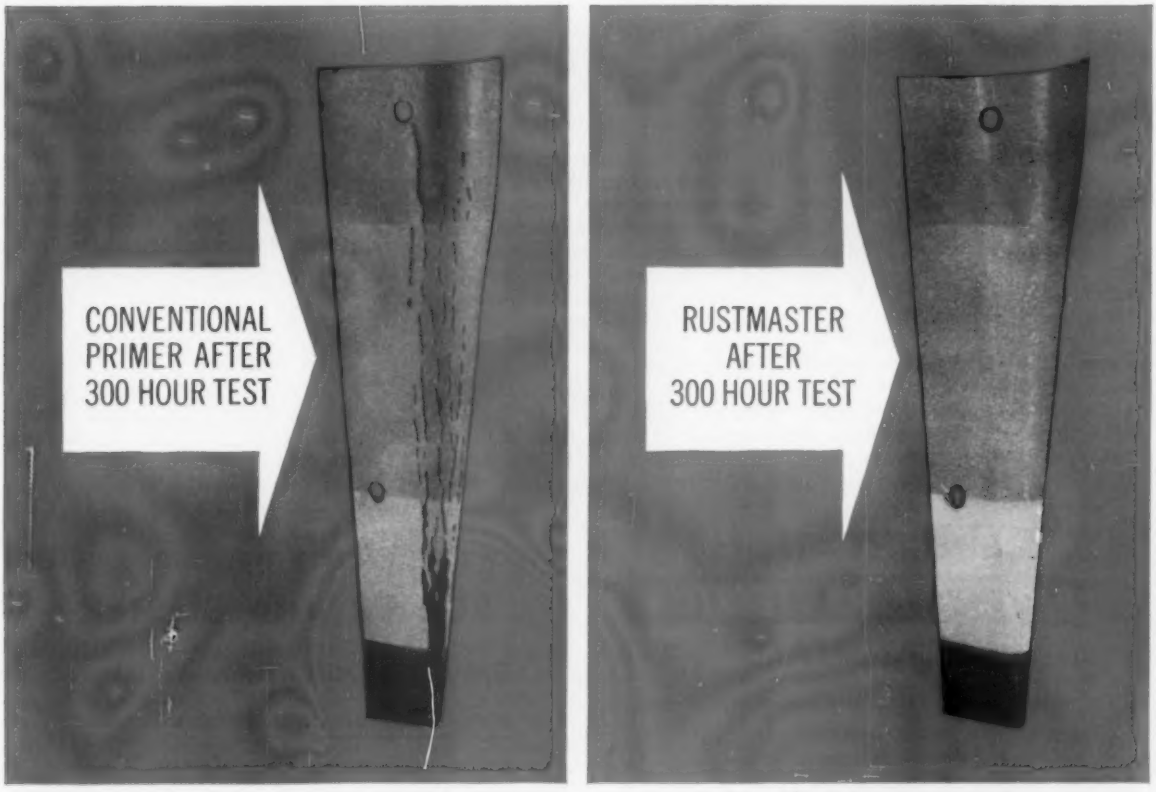
**Manufacturers expect a demand for polypropylene well in line with its production capacity. Estimates range all the way from 300-million lb. to 450-million lb. a year, within the next four years.**

David C. Williams, vice-president of Eastman Chemical Products, Inc., gives the following breakdown (figures in millions of pounds per year):

| | |
|---|---|
| Polypropylene film | 200 |
| Injection molding | 115 |
| Extrusion applications | 75 |
| Monofilament extrusion | 35 |
| Textile fibers | 25 |

**Manufacturers say polypropylene has many outstanding qualities, which**

# Rustmaster Metal Primer is 27% more corrosion resistant

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**justify their optimism about its future.**

In the first place, Hercules says, polypropylene is the lightest in weight of all commercial plastics: One pound of it makes substantially more of the finished product. In addition, it has excellent heat and chemical resistance, impact strength, and rigidity. Its rigidity is such, Hercules says, that it can now compete successfully with Cellophane for use in packaging machines.

The unique flexing ability of polypropylene is an important factor in its selection for many packaging applications. Eastman calls it the "plastic with the built-in hinge."

**Applications of polypropylene are growing, as new techniques for its processing are developed and improved.**

For example, Eastman says its Tenite polypropylene can take a wide variety of bright colors. Hercules is developing the use of its Pro-fax in fibers: It recently purchased a fiber-spinning mill at Covington, Va., with a capacity of 10-million lb. a year.

And at last week's Packaging Exposition of the American Management Assn., in Chicago, Enjay Chemical Co. division of Humble Oil & Refining Co. conducted demonstrations of injection molding, to show the versatility of its Escon polypropylene.

# Cheaper Supplies Can Cost More

**When selecting a product for maintenance purposes in a refinery or a petrochemical plant, it's the total cost of utilization of that product that should be considered, not only its original cost.**

This principle was brought out several times during this week's Maintenance & Plant Engineering Conference of the American Society of Mechanical Engineers, at Worcester, Mass., as maintenance engineers from many companies described the progress made recently in their plants by a more realistic evaluation of the maintenance problems.

**That total cost includes: cost of material and installation, subsequent maintenance cost, product losses in case of unscheduled shut-downs, and eventual replacement cost.**

Oddly enough, this principle was not always recognized, because the adoption by the industry of maintenance cost records is a relatively new development.

"Thirty years ago," said E. A. Rachal, of E. I. du Pont de Nemours & Co.'s Savannah River (S.C.) plant, "maintenance cost records were practically nonexistent. Today we have high-speed data processing equipment that is capable of recording, storing, calculating, and reporting information with speed and accuracy far beyond previous limits."

Ted R. Witt, of Tennessee Eastman Co., described certain changes he made on his equipment, with the result that substantially longer periods of continuous operation are now possible. For example a group of blowers in continuous operation, which had been equipped with ball bearings, were changed to ring-oiled babbitt bearings, because, Witt said, "when the stops and starts of a machine are infrequent, plain bearings will run almost indefinitely."

A change to a much more expensive metal eliminated the trouble with a shaft that was breaking too often because of vibrations, Witt reported.

And he cited cases where the use of a higher-quality grease in ball bearings proved much more economical in the long run. "Ball bearings," he said, "when good lubricants are used, will run for very long periods without relubrication. It is our opinion that any ball or roller bearing under normal conditions that is greased more


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often than every two or three years is being greased too frequently."

**Among the materials that are becoming increasingly popular for the reduction of maintenance cost on a total cost basis are the fluorocarbon resins**—such as Teflon, Kel-F, and Kynar.

These resins are either tetrafluoroethylene (such as Teflon TFE) or fluorinated ethylene-propylene (such as Teflon FEP). They can be used for continuous service at temperatures up to 500F and 400F respectively.

They can be shaped either by powder metallurgy—that is, by agglomerating the powdered resins under pressure and temperature—or by molding and extrusion; and they are readily machinable. These resins are often compounded with fillers, when special properties are required, for example glass fibers, graphite, molybdenum disulfide, asbestos, metal powders.

**The initial price of these resins is still high, but their unusual resistance to chemical attack makes them economically desirable,** the speakers pointed out.

R. D. Pillsbury, Jr., Du Pont's technical representative, cited typical cases of savings when Teflon was substituted for other materials. Teflon fiber, for example, was used as a packing in a centrifugal pump moving a soda-salt solution at 212F. The Teflon fiber cost $35 a pound, or $17.70 per packing, installed. The cost of the other packing (a graphite-lubricated asbestos packing) was only $8.55.

But because the Teflon job lasted eight weeks, whereas the previous packing lasted one week only, a saving of $50.70 was realized every eight weeks—$300 a year.

Pillsbury also reported the case of a major oil company where Teflon piston rings and rod packings were substituted for metal parts in three ethylene compressors. Maintenance costs were reduced 22%, he said, for the first year of operation.

**These fluorocarbon materials are very versatile and can be used in a great variety of applications.**

Among those that were described at the ASME meeting were: packing and gaskets, pipe and container linings, valves, bellows and diaphragms, flexible hose, piston rings and bearings, and electrical insulation components, of high dielectric value.

# What's New / IN PROCESSING

**Linde Co., division of Union Carbide Corp., will build a 100-liter-per-hour liquid helium plant at Amarillo, Tex.,** adjacent to its oxygen plant there. Completion is scheduled for January 1962.

Gaseous helium that will be processed at the new plant will come from the government's helium recovery plant at Soncy, Tex. Helium is extracted from natural gas by low-temperature separation and adsorption.

The company plans to supply liquid helium to the growing number of research organizations engaged in cryogenic work.

Linde says its specially designed cryogenic container, which reduces evaporation loss, makes it economically possible to store and transport liquid helium.

•

**W. R. Grace & Co. plans to build a 60,000-ton-per-year ammonia plant in Big Spring, Tex.** Foster Wheeler Corp. has been awarded the contract to design and build the unit, which will supply fertilizer to the West Texas agricultural area.

**A 1,500 b/d Unifining unit will be built at Westland Oil Co.'s Williston (N.D.) refinery.** Cost of the project has been estimated at $300,000.

The new unit will bring the treating capacity of the refinery to 3,000 b/d, and will allow Westland to process liquids from gas plants to be constructed in the area this year.

•

**A super-lubricating grease that far exceeds military specifications for purity has been developed by Miniature Precision Bearings, Inc.,** the American Society of Lubricating Engineers was told at its annual meeting last week.

Minapure, the new grease, is 400 times cleaner than available greases meeting the highest specifications, the bearing manufacturer says. Even the cleanest greases commercially available to date can ruin performance of precision instrument bearings, it adds.

Under testing methods outlined by military specifications, no dirt particles or contaminants can be found in Minapure.


# What's new

## IN CAT CRACKING

**Davison SM-30 is the first regenerable silica-magnesia fluid cracking catalyst ever offered for commercial use.**

Designed to maximize liquid products in the 200-650°F boiling range. SM-30 combines high activity operation with a selective product distribution. **The significant increase in liquid yield is at the expense of coke, light gases and residual fuel.**

**Pilot plant evaluations of SM-30 indicate the following changes in product distribution—compared to 13% silica-alumina.**

- Coke: down 0.1-0.3 wt. %
- $C_2$ and lighter: down 0.1-1.0 wt. %
- $C_3$'s: down 3.5-4.9 vol. %
- $C_4$'s: down 3.9-5.2 vol. %
- Gasoline: up 4.1-7.9 vol. %
- Furnace Oil: up 4.6-5.6 vol. %

The full range gasoline was approximately 2.5 research octane numbers lower at the 3cc. T.E.L. level. This loss occurred primarily in the heavy naptha fraction boiling above 216°F.

SM-30 is the result of a Davison research program launched in 1948, with the commercial testing of a silica-magnesia catalyst manufactured by the usual techniques. This product proved less than totally satisfactory. Once studies had pinpointed the problem as low pore volume, Davison developed modifications of the manufacturing techniques and used trace stabilizing elements to arrive at a new product with genuine promise of high catalytic efficiency.

SM-30 has a high initial pore volume and is thermally stable at temperatures up to 1750°F. Its regeneration rate is the same as that of synthetic silica-aluminas.

**A comprehensive report of the pilot plant research responsible for SM-30, including several yield studies, is available from Davison.**

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# Cluster of Oil Finds Is Outlined in New

**The Middle East's newest oil province may be taking shape at the southern end of the Persian Gulf, where oil has been found now in three separate areas—one onshore, the others offshore.**

Relatively little, if any, information has been released on the potential of any of them. But recent developments indicate that all three areas may be considered potentially commercial.

The onshore discovery was made in the sheikdom of Abu Dhabi by an Iraq Petroleum Co. associate, which is now concentrating its Trucial Coast drilling there.

Offshore from Abu Dhabi, another field is under development jointly by British Petroleum Co. and Cie. Francaise des Petroles.

And to the west, Shell has found oil in two tests east of Qatar peninsula, where it may have established the Persian Gulf's newest offshore field.

# Creole Loses Sales in Western Hemisphere, Gains in Europe

**Creole Petroleum, Venezuela's top producer, increased its sales to Europe 38% last year—while losing ground in Western Hemisphere markets, its major outlets.**

These results were detailed in an annual report released last week by the Jersey Standard affiliate, which produces over one-third of Venezuela's oil.

It showed net income of $204,983,019 during 1960, and said tax payments to the Venezuelan government will amount to $375-million for the year. This is approximately a 65-35 ratio.

**Its total sales of crude and products were up 3%** to 1,183,432 b/d—from 1,145,715 b/d in 1959—with 94% moving into world markets and the rest sold in Venezuela.

The 38% increase in European sales brought the average there to 236,184 b/d, accounting for 20% of total 1960 sales—up from 15% in 1959.

Sales in the Western Hemisphere dropped nearly 6% to 894,795 b/d. This was 75.6% of 1960 sales, down from 83.4% in 1959.

**Creole cited competition from both Russian and Middle East oil as a factor adversely affecting its realizations from the sales of crude and of products.**

Increased sales of Russian oil at prices "well below market levels" were a feature of the "very intense" competition in world markets resulting from continued excess of supply over demand.

In addition, Creole said, increased competition from Middle East oil was felt in several markets in the Western Hemisphere, due to the Persian Gulf crude price cuts last August and to depressed tanker rates.

**Sales to the U.S.—Creole's biggest market—fell 7%, due largely to import restrictions, and sales in Canada dropped nearly 6%.**

U.S. sales averaged 418,329 b/d, dropping to 35.3% of Creole's total, from 39.3% in 1959.

In Canada—Creole's third-largest market (the United Kingdom was second)—the year's sales averaged 104,962 b/d, dipping to 8.9% of the total, from 9.7% in 1959.

**In other Western Hemisphere markets, Creole's sales were also off some 6%,** totaling 371,504 b/d with the U.S. and Canada excluded. This was 31.4% of the 1960 total, down from 34.4% in 1959.

In Argentina, for example, its sales dropped 21% as a result of increasing crude production there. And in Cuba, Creole lost a 45,000 b/d outlet with seizure of the refineries by the Castro government.

In Brazil, Creole's sales of crude dropped sharply due to intensified price competition when the government oil company changed its pur-

## Perez Sees Americas

**CARACAS—Oil Minister Juan Perez Alfonzo considers Venezuela's "natural market" for oil as extending from the Atlantic to the Pacific coasts of the American continents.**

Last October, Perez stated a more limited view, on the Canadian market. Venezuelan policy, he said then, was to prevent sales west of Quebec of either Venezuelan crude or products refined from it in Montreal.

# Mideast Area

**Delineation drilling under way at Murban, in Abu Dhabi, has apparently confirmed discovery of the first onshore field in the southeastern end of the Arabian peninsula.**

No information on its potential has been officially released to date, though Jersey Standard, a participant in IPC, said in its annual report that delineation drilling was "successfully continued" last year.

IPC headquarters in London would add little last week, except to say that further drilling will be necessary before the extent and potential of the field are determined.

IPC's Trucial Coast associate currently has two rigs on the Murban structure, where it will shortly spud two new tests. So far it has drilled five, roughly in crescent formation. One is reportedly a 25-mi. stepout that found oil in the same horizon as the discovery, though this could not be confirmed officially.

Oil was first found in 1953 in No. 1 Murban, now abandoned due to mechanical difficulties.

No. 2 Murban also found some oil 5 mi. south in 1959 but was subsequently completed as a gas observation well.

No. 3 was brought in last year 7 mi. west of No. 2, encountering "several interesting shows of oil" below 8,400 ft., and IPC in London says it is in condition to produce when installation of production facilities is completed.

Since then, No. 4 has also found oil at the north end of the field, while No. 5, IPC says, is an oil/water observation well.

**Some 60 mi. offshore, in Abu Dhabi's waters, a fifth test is being drilled in the Umm Shaif field, which is slated to be put into production next year.**

No dry holes have been drilled on the structure east of Das Island so far and it is reportedly only one of 11 on the offshore concession. It is held by Abu Dhabi Marine Areas Ltd., owned ⅔ by BP and ⅓ by CFP.

The No. 1 discovery well was brought in in 1958 with an announced initial test rate of 2,400 b/d, though it is believed capable of producing twice that. The second was described as "disappointing," producing only 1,000 b/d from a tight formation. No. 3 however, was reportedly tested at a 5,000 b/d rate in a different formation, with prospects that it might prove productive in two others as well (PW—Jan.29'60,p35). Test rates in No. 4 have not been announced.

**On an adjoining offshore concession east of Qatar, Shell is drilling a fourth test at Idd el Shargi to evaluate the potential of oil encountered in two of three tests** it has drilled on the structure so far.

Oil was first encountered in No. 2 Idd el Shargi, Shell's third wildcat on the concession and the first since it resumed drilling with a new platform in early 1960 after two dry holes. (Its previous unit was wrecked by a freak swell in 1957 when it was being moved to a third site.)

Shell abandoned its next wildcat—No. 1 Hadet Shibeeb—as a dry hole on another structure last September. Moving back to Idd el Shargi, it recently found oil in its No. 3 test there.

chasing policy from long-term contract to a spot basis.

Increased product sales, however, largely offset this loss, bringing Creole's total sales there to 69,829 b/d, compared with total sales of 73,017 b/d in 1960.

In Venezuela, Creole's product sales dipped 2% to 58,755 b/d, with a 5% increase in international bunker sales partly offsetting a drop in the domestic market.

Sales were also down in Aruba, the Canal Zone, and Puerto Rico, while a few gains were registered—in Chile, Colombia, and Trinidad.

## As Natural Market

He expressed his new view last week in testifying before a Venezuelan Senate committee on the Organization of Petroleum Exporting Countries.

Perez told the committee that definition of natural markets is under study, and that Venezuela might economically continue to supply Western Europe, since it produces a wide variety of crudes.

# U.S. State Dept. Sees Only Minor Growth in OPEC Market Share

**CARACAS—A U.S. government analysis of the Organization for Petroleum Exporting Countries has been published by Venezuela. It predicts OPEC countries will have only a minor share of the future growth rate in Free World markets for foreign crude.**

The analysis concedes OPEC could stabilize crude prices at higher levels if it wields the "powerful weapon" of control over a big part of Free World oil supplies.

At the same time, it discounts prospects of establishing international proration—because North African and Soviet crude is expected to take the lion's share of Free World market growth in the next five years.

**The document, it was learned this week, was prepared by the U.S. State Dept.** exclusively for its own internal use, as a routine analysis of an agreement between governments.

A translation of the 15-page study was published in the Venezuelan Oil Ministry's weekly bulletin, which said it was prepared by a "friendly government"—later identified publicly by Oil Minister Juan Perez Alfonzo as the U.S.

Perez, who was grilled on OPEC by a Senate committee recently, presumably published it as an argument from a third party in favor of Venezuela's participation in OPEC.

**The U.S. State Dept. calculates that the five founding members of OPEC produce 44% of the total world oil and have some 90% of the "competitive market supplied by principal oil exporting countries."**

In any emergency, the study says, "it is considered impossible that free world oil production can be increased sufficiently to compensate for loss of production of OPEC countries over a period of several years."

In such an event, it adds, oil would have to be replaced by more costly energy sources.

In addition, pressure would increase on non-Communist countries to absorb more Soviet oil.

**The conclusion is "inevitable," it says, that OPEC countries could stabilize prices at higher levels** and thus increase their oil income—if they

recognize this "powerful weapon" and exert all means available to obtain the regulation they desire.

**The document warns that nationalization of the oil industry by OPEC countries is "not inconceivable"—despite the loss of oil revenue it would entail**—if other methods of regulation do not achieve desired results.

The analysis calls the possibility of expropriation "remote" but points to this danger that nationalization could be followed by direct approach of OPEC countries to governments of consuming countries such as Europe's.

**Little incentive for proration is seen in the analysis—which predicts the production growth rate of OPEC countries through 1965 will be only 1% annually.**

While the "competitive market" for foreign crude is expected to expand 5.8% annually—from 8,555,000 b/d in 1960 to 11,300,000 b/d in 1965—the OPEC countries' share of the increase will probably be only 395,000 b/d. Thus they will have to struggle to retain their shares of the market, the study says.

**Algeria, Libya, and the Soviet Union are expected to supply most of the 5.8% annual increase.**

Since Algeria has a natural market in France, and Libya has a geographic advantage over the OPEC countries, probably neither will see any benefit in joining OPEC.

**The document points out that OPEC is particularly attractive to Venezuela, since it has little or no prospect of increasing production** without OPEC regulations.

In addition, it says, Venezuela faces the possibility of further price cuts to keep its oil competitive.

# What's New / AROUND THE WORLD

## 60-40 Is Decreed By Indonesia

**INDONESIA—A 1975 termination date and 60-40 profit-sharing terms were set by the government on present oil rights held by Shell, Caltex, and Stanvac by a decree** reportedly signed last week.

Details were not immediately available, but indications were that further lengthy discussions were expected on implementation of the 60-40 terms.

The limited continuation of existing rights was provided for in the new oil law that went into effect Jan. 1 under which private oil companies otherwise will operate as contractors to government companies. The government is reported still studying general principles regarding new areas for the established companies and newcomers.

•

**BOLIVIA—Shell and California Standard have acquired by assignment rights to five concessions from Alaska International Corp.** (formerly Cataract Mining Corp.) The rights cover 283,000 acres in Zone 1 east of Santa Cruz and adjacent to concessions now held by Shell and Stancal on which a test is now being drilled.

•

**VENEZUELA—Mobil has spudded the first of three tests it plans for this year on Lake Maracaibo acreage taken as a farmout from Creole.** The 11,416-acre mid-lake tract has three shut-in productive wells previously drilled by Creole. The venture is the first in the lake for Mobil, which will finance it, retaining 75% of the oil produced.

•

**AFGHANISTAN—The Russians report a wildcat gas discovery, first in the country—where they also found oil last year** under their three-year-old exploration program for the government. The gas was found at 5,307 ft. in a northern wildcat at Hodja-Gugerdag and was tested at the rate of 17.6-million cf/d through 1/16-in. choke, the official Soviet news agency reported from Moscow last week.

•

**KUWAIT—The new Kuwait National Petroleum Co. will take its first step into the oil business on June 1.** The company, owned 60% by the government and 40% by the public, will take over internal product distribution from Kuwait Oil Co., operator for Gulf Oil and British Petroleum, joint onshore concessionnaires in Kuwait.

•

**TURKEY—Mobil has spudded another wildcat in the Adana Basin of south-central Turkey—this one 38-mi. southwest of its Bulgurdag field** and 7 mi. northeast of Mersin, site of a refinery now being built by Mobil and others. The company recently abandoned the Kocadere wildcat west of Bulgurdag, after drilling to 3,521 ft.

•

**EUROPE—Mobil has set out to acquire additional retail outlets in northern Europe during 1961.**

In its house organ, Mobil World, the firm said it was concentrating particularly on retail marketing expansion in the United Kingdom, Scandinavia, Belgium, the Netherlands, and Luxembourg.

•

**IRAQ—All exploratory work was suspended by Iraq Petroleum Co. last week on order of Premier Kassim, due to failure to agree on rentals.**

# More Oil Found in Western Libya

**Oasis Oil Co., jointly owned affiliate of three U.S. firms, has reported an oil discovery near the western border of Libya—the second in that area in recent weeks.**

Oasis is owned equally by Amerada Petroleum, Continental Oil, and Ohio Oil.

Last month a French firm, Cie. Francaise des Petroles, had a discovery in its Block 23 in northwestern Libya, not far from the Algerian Sahara border. Final tests on that wildcat, E-1-23, are now being prepared.

Exploration in the west has not been very intense lately. While the oil companies were first drawn to the border area, partly by important discoveries in Algeria, they have in recent months been most active in the Syrtica Basin of central Libya. It is there that the major discoveries have been made.

**The newly announced Oasis discovery swabbed 25 to 50 bbl. per hour of 33-gravity oil,** the company reported.

Production from the well, the D-1 wildcat in Block 26, about 180 mi. south of the Mediterranean, came from a pay zone around 4,300 ft.

**The find is Oasis' second on Block 26.** The first, A-1-26, some 77 mi. southeast of the new discovery, produced 450 to 500 b/d on test last year. A confirmation well is now being drilled in the A-1-26 area.

The order followed the government's abrupt suspension of talks with IPC on long-pending issues a half-hour after they were resumed. The move was seen as forcing a stalemate on a minor point when over-all agreement was in sight. The aim: to maintain the status quo for domestic political reasons, since any settlement would be a target for the opposition.

•

**INDONESIA—Refining Associates, Long Beach, Calif., will finance and build a carbon black plant in north Sumatra for repayment in crude by Permina,** the government company that holds former Shell fields there. The U.S. firm will sell this crude in Japan, where it has also been selling Permina's minor production as broker. That deal was made before the Japanese agreement to finance further development of the fields.

•

**INDONESIA—The Japanese will spud their first test in north Sumatra next week** on former Shell fields now held by the Indonesian government's Permina. Through North Sumatra Oil Development Co., they are financing development of the fields and will be repaid in oil, getting 40% of the increased production for ten years. They hope to move some 315,000 bbl. of the crude to Japan this year, with shipments starting in October.

•

**IRAN—The Consortium announced it has tested oil and gas in its first development well at the new Ahwaz field** where its No. 6 wildcat discovery produced 6,032 b/d on continuous test throughout 1960. The new well, No. 8, was tested at 8,500 ft. after penetrating 470 ft. of the Asmari.

•

**SINGAPORE—A marketing affiliate of Union Oil Co. of California and the Japanese firm, Maruzen Oil, will build five service stations here as outlets for product from Maruzen's refinery, now under construction.**

The Japanese firm is building the 20,000 b/d plant jointly with another Japanese company, Toyo Menka, with financial backing from Union. The stations will be completed next spring.

•

**FRANCE—The first of a series of long-term loans to build the $121.2-million Mediterranean-Rhineland pipeline has been floated** by Soc. du Pipe Line Sud-Europeen, which will build and operate the line for a 16-company group. The first loan, secured in France, was for $24.2-million.

## It's a Royal Occasion in the Neutral Zone

**The King of Saudi Arabia and the Sheikh of Kuwait (seated left and right, respectively) were the royal guests of honor at the ceremonies officially inaugurating commercial exports of Persian Gulf oil by the Japanese-owned Arabian Oil Co. earlier this month. The ceremonies were held at Arabian Oil's permanent onshore base in the Neutral Zone. One of the onlookers is Saudi Oil Minister Abdullah Tariki, standing at the extreme left among other officials.**

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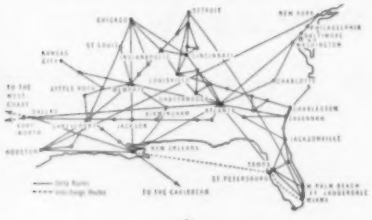

DELTA

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**SHELL OIL COMPANY**

# PETROLEUM WEEK'S Fingertip Figures

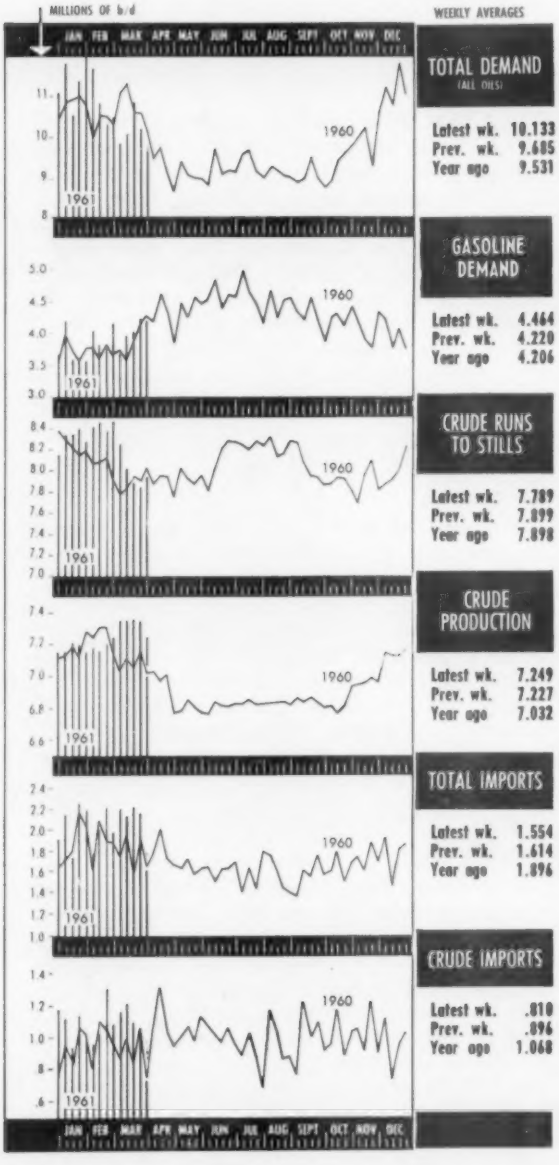
**Last week was a good one all 'round—demand was up and stocks were down for each of the four major products.**

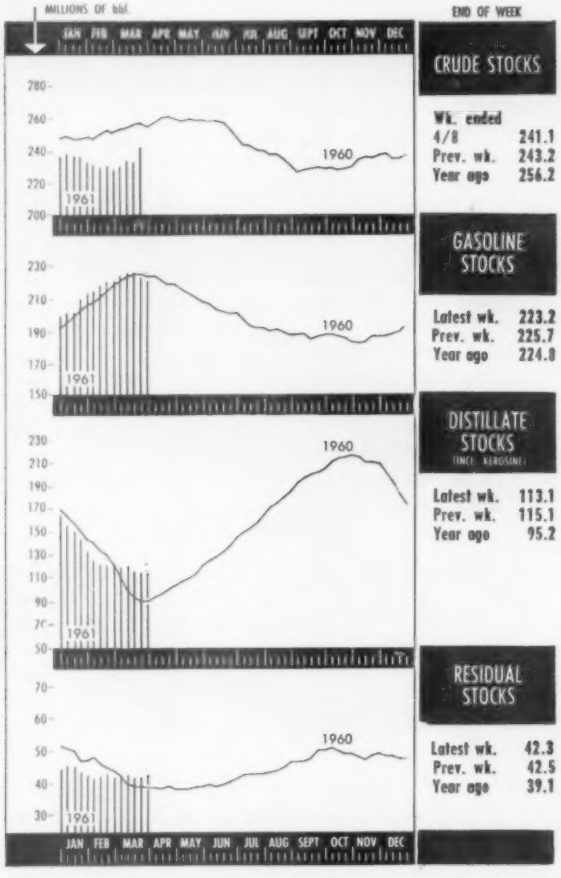
Total demand passed the 10-million b/d mark—strong for this time of year. Gasoline accounted for close to half of total demand, averaging 4,464,000 b/d. Distillates demand showed up well, too, jumping 178,000 b/d to 2,328,000 b/d over the past week. This most likely is a flash in the pan, however. Demand for distillates can be expected to fall sharply now that warmer weather has set in.

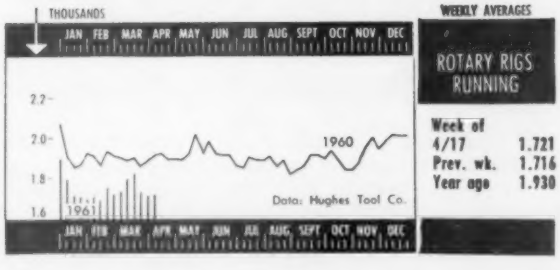
Major products inventories fell by almost 4.7-million bbl. last week to total 378.6-million bbl. Gasoline stocks headed the list with a decrease of 2.5-million bbl. Distillates inventories fell by 1.9-million bbl., kerosine 125,000 bbl., and residual 205,000 bbl.

**The 110,000 b/d cut in refinery runs brightened the April outlook, too.** Crude throughput, which had shown signs of creeping up to previously high levels, averaged 7,789,000 b/d last week, lowest since mid-November.

All figures below are for the week ended Apr. 14 unless otherwise noted.



# Company Developments

**Dresser Electronics, SIE Division, has been picked by the Army to study the feasibility of using seismic technologies to determine the position of missile impact locations.** Army scientists hope that existing seismic instrumentation and current methods can be used to detect and pin-point impact points remote from observation points.

•

**Thompson Ramo Wooldridge, Inc., is beefing up marketing and new product development by setting up a new operating unit**—the electronic systems and equipment group. This will include the operating divisions formerly known as the company's commercial electronics and intellectronics groups.

•

**Two high-speed towboats especially designed to push cargoes of molten sulfur and petrochemicals on inland waterways have been christened by Canal Barge Co., Inc.,** New Orleans. The new vessels are the 4,320-hp. Eugenie P. Jones, built by Dravo Corp., Pittsburgh, and the 3,200-hp. Ned Merrick, built by Southern Shipbuilding Corp., Slidell, La., both capable of pushing cargoes of more than 12,000 tons.

•

**Reed Roller Bit Co. is considering further diversification, according to John Maher, president.** "We intend to grow not only in our present fields of oil equipment, air tools, and electronics, but in any field where there is an opportunity for the people of Reed to apply their minds, money, and management," he said.

•

**The pipe coating division of H. C. Price Co. has won a contract to coat approximately 23 mi. of 24-in. and 30-in. pipe for United Gas Pipe Line Co.** The pipe, which will be used in four separate projects, will be handled at HCPCO's permanent pipe coating plant at Harvey, La.

•

**Lenkurt Electric Co. will move its Southwestern district sales office from Kansas City to Dallas in early May.** The General Telephone & Electronics subsidiary provides engineering services and manufactures a broad range of electronic telecommunications equipment for pipelines and other industries.

•

**One of the largest recent polyvinyl chloride plastic pipe jobs in the petroleum field was for gathering lines at Pierce, Colo.** More than 50,000 ft. of A. M. Byers Co.'s 2-in. diameter pipe was specified to replace a 2-in. diameter steel pipeline.

•

**A $5-million mill to produce seamless steel tubing three times as fast and with greater efficiency than heretofore possible in the U.S. has been opened by Gulf States Tube Corp.,** a subsidiary of Michigan Seamless Tube Co. The new mill at Rosenberg, Tex. (near Houston) features a giant 1,800-ton mechanical vertical extrusion press that extrudes 150 billets per hour, producing 80 to 260 ft. of hollows per minute. The company says it is the world's first and only fully automated, in-line hot mill for production of seamless steel tubing.

•

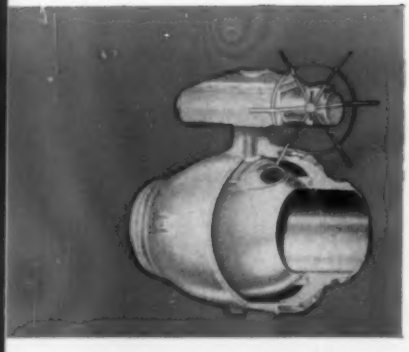
## Overseas

**Grant Oil Tool Co. is expanding its overseas services for French, Middle Eastern, and Argentinian oil fields.** The company has appointed three drilling equipment sales and service firms to represent the company in these areas. S. N. Marep, Paris, will represent Grant in France, North Africa, and Franc area countries; Macridge Petroleum Equipment Supply Co., Beirut, will represent Grant in Lebanon and the Middle East; and Drillex, Buenos Aires, in Argentina.

•

## Research

**A survey just completed by Cleaver-Brooks Co., Milwaukee, shows that steam and hot water are rapidly becoming research tools instead of simply heating devices** in university, medical, and industrial laboratories throughout the country. At the same time, this steam and hot water must have high quality and be available at pin-point temperatures and pressures 24 hours a day through the year.



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# Tidewater Oil Plans Growth in LP-Gas

**Once faced with loss of its entire LP-gas market, the company now envisions "an extraordinary future."**

**Tidewater Oil Co.—currently digesting its new LP-gas retailing operations—is planning further expansions into the western LP-gas market.**

Tidewater moved into LP-gas retailing for the first time last fall when it purchased Vangas, Inc., of Fresno, Calif.

Through this move, the company gained 41,000 retail customers and 47-million gal. of LP-gas sales a year.

Tidewater intends to enlarge Vangas' internal operations (which are concentrated in California, mainly, and four other western states), and also plans to add other acquisitions.

Meanwhile, the company has already prepared a team of salesmen to approach Vangas customers in the hope of selling them the regular Tidewater line—gasoline, diesel fuel, lubricants, and other products.

This integration of marketing operations works in reverse, too. Tidewater is planning to sell LP-gas at its network of service stations in the West, where a moderate motor vehicle demand is anticipated. Using Vangas' strategically located distribution centers, Tidewater feels it can transport the product easily to its stations.

Although Tidewater plans to broaden its whole LP-gas operation in the West, it is unlikely that it will move too far toward the Midwest. It does not want to jeopardize its chances to consolidate with Skelly Oil Co., should merger talks be resumed. Skelly runs a large LP-gas operation in the Midwest.

**Tidewater's expansion efforts are suggestive of a general industry trend toward wider development of LP-gas opportunities by major oil companies.**

Reversing the trend that once saw major oil companies backing away from LP-gas marketing, two subsidiaries of Sinclair Oil Corp. last year expanded processing and marketing facilities in the Midwest to take advantage of increased demand there.

Farther south, Mobil Oil Co. acquired Anchor Petroleum Co., Tulsa. Anchor owns Petrolane Gas Co., a Louisiana-based retailer.

And Standard Oil Co. (Ind.) last year strengthened its position in LP-gas.

It required several distributors and adding four district offices (to a

# Bowser Installs Electronic Fuel Pump

**Device flashes fuel data to flip-chart indicator.**

**Bowser Inc. announced last week that Wake Up Oil Co., Ft. Wayne, Ind., has installed its new Modular Electronic Computer Fueling System.**

"The Wake Up installation, completed by Bowser in March," the company says, "has historic significance. It marks the world's first commercial use of advanced electronics in the retail dispensing of gasoline."

In parallel developments, two European companies, de Havilland Engine Co. and Wayne Tank & Pump Co. (a subsidiary of Symington Wayne Corp.) have announced that they are installing similar electronic dispensing systems in England.

De Havilland's first units will actually be opened in Italy at British Petroleum Co. outlets there.

Although all three systems have striking similarities, the application of electronic transmission of metered flow information to a remote computer dial opens the way for imaginative innovations in station design—especially at the pump island.

**The Bowser system incorporates a flip-chart approach to give motorists greater visibility of computer readings.**

As each tenth of gallon of gasoline is dispensed into a motorist's tank, the computer mechanism flips down a new number.

The same process is applied to registering the cost of fuel dispensed.

The Bowser system (Bomelco) also permits three grades of gasoline to be pumped from a single unit, "thus sparing the motorist the necessity of positioning his car beside a particular dispenser," the company points out.

MOTORISTS may watch gasoline and cash indicator, placed in front of their cars.

## in the West

total of 12) to handle the increased demand.

**Tidewater's entry into LP-gas retailing—although motivated by a bright LP-gas outlook—was actually necessitated by the irretrievable loss of wholesale outlets to natural gas.**

Historically, Tidewater had disposed of its LP-gas through sales to cities that lay beyond the gas mains.

But an advancing natural gas pipeline company has been picking off Tidewater's municipal accounts one by one, leaving the oil company with nowhere to turn to find substitute wholesale outlets for its LP-gas.

Currently, Tidewater is losing municipal markets in Oregon, and by August, it expects to suffer the loss of one or more municipal accounts in California.

"It's just a matter of time until all such wholesale customers are lost," says James McDonald, western division marketing manager for Tidewater and a member of the Vangas board.

"Without retail outlets," McDonald explains, "we would be hard-pressed to find customers to take over the 25-million gal. of product that we had been selling annually to cities that are now going on gas pipelines."

**Before its expansion into retail marketing, Tidewater had a capacity for producing more LP-gas than it could sell.**

According to McDonald, "Tidewater can produce about 80-million gal. of LP-gas a year. At best, we had been selling only about 55-million gal."

Excess LP-gas is derived through summer refinery operations, and is flared or burned as a fuel gas.

Tidewater has long-range plans for increased storage capacity, so that excess LP-gas can be stored for winter months.

All of Tidewater's LP-gas is produced as a by-product from its Avon refinery in California or from a gasoline plant in the Ventura oil field.

**The acquisition of Vangas, Inc., gave Tidewater its much needed outlet for surplus LP-gas.**

"It also provides," McDonald adds, "the means for a smooth transition from wholesale to a predominantly retail mode of operation."

With the transition set in motion, McDonald says, Tidewater can expect "an extraordinary future for LP-gas."

"The trend for the refinery," he says, "seems to be toward light end products. Gas, gasoline, LP-gas, jet fuels, kerosine, and light fuel oil will be the main products of the future—with almost no heavy end."

Furthermore, the constant development of new applications for LP-gas on the farm, for vehicles, and in industry, McDonald says, tends to reduce the weather's influence on LP-gas sales.

"Although the weather is still a factor in Vangas' sales volume," he says, "its effect is being constantly reduced, as home fuel sales account for a smaller percentage of total sales each year." In 1955, Vangas' domestic sales accounted for 76% of the company's total gallonage. This proportion has been reduced to 23%.

---

To give the attendant greater freedom, Bowser has incorporated a presetting device, which permits him to preset the amount of fuel to be dispensed.

He can then service some other part of the car while the pump delivers the fuel unattended.

The attendant's single dial-like operating switch is located in the pump's nozzle.

The Bowser system had been first announced in the fall of 1959 (PW—Nov.6'59,p124).

### Conoco Tries Private Brand in Houston

**Continental Oil Co. apparently likes the idea of marketing under a private brand. It is now experimenting with "Kayo" brand in Houston.**

The company has taken down the "Conoco" trademark at one of its large stations there and replaced it with the private brand label.

Continental has used the Kayo brand name in other markets, primarily in the Southeast, for several years.

## Humble Plans to Mix Outboard Fuel in the Nozzles of Pumps

**Outboard motorboat owners have complained for years about having to mix oil with their gasoline. Now Humble Oil & Refining Co. is volunteering to do it for them—right in the nozzle of a gasoline pump.**

The company isn't certain how the results will turn out, so it plans to experiment this season for boating enthusiasts along the Texas shore of the Gulf of Mexico.

At the moment, the company is dispensing Humble Pre-Mix through conventional pumps located at service stations in Houston and other Texas cities near the Gulf. Pre-Mix is a prepared mixture of gasoline and outboard motor oil.

Humble reports a slow demand—but then the outboard season hasn't quite started yet.

**Humble plans to use a new pump—manufactured by Gilbert & Barker Manufacturing Co., West Springfield, Mass.—to mix oil and gasoline in the nozzle.**

With this pump, Humble will actually be dispensing gasoline from one tank and oil from another.

There is a selection dial on the pump that permits service station attendants (and marina operators) to adjust the mixing ratio to either of the most popular fuel combinations—one part oil to 24 parts gasoline or one part oil to 20 parts gasoline.

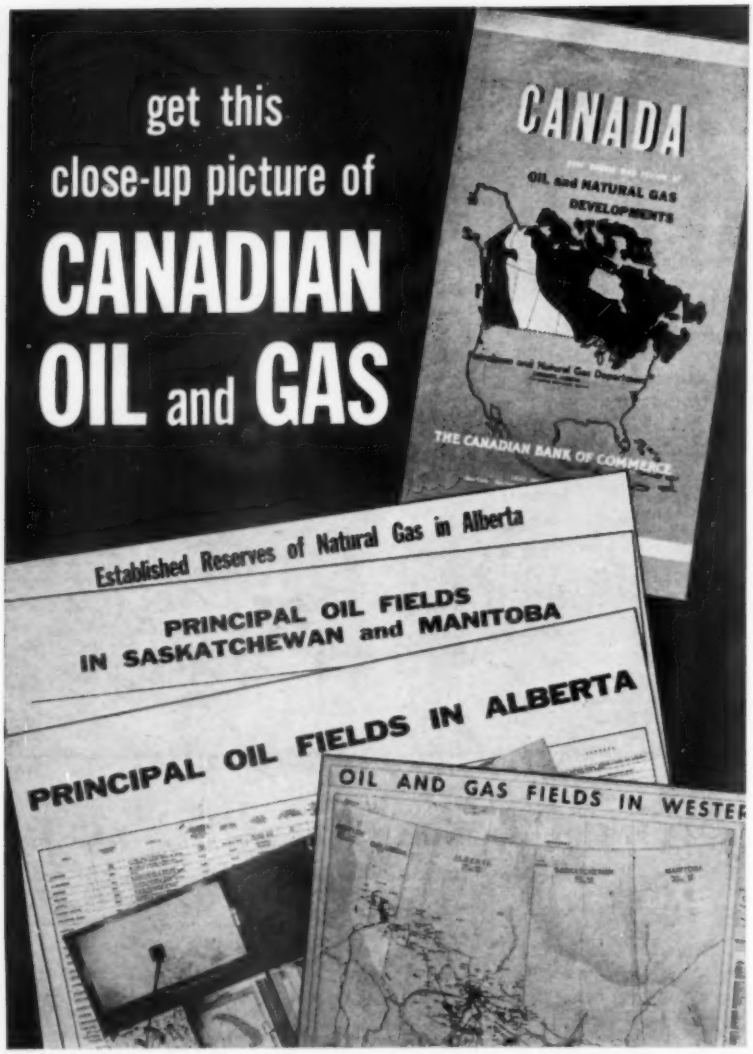
Gilbert & Barker reports that at these ratios it has encountered no evidence of foaming, which has been mentioned as a problem in mixing oil and gasoline at fast delivery speeds.

The pump also will dispense gasoline only. This is especially important to dealers who wish to fill outboard tanks and, through the same pump, serve regular motorists.

**Two computer dials on the pump separate the prices and the amounts of oil and gasoline dispensed.**

To get a combined total, dealers will have to add the two amounts.

But a Gilbert & Barker spokesman points out that by providing separate totals for oil and gasoline, the pump permits dealers to record the amount of gasoline they have sold for marine purposes. This fuel is not subject to the federal tax on gasoline that is used for automotive purposes, and therefore merits a tax refund for dealers.

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# What's New
## IN MARKETING

**Residual fuel oil has emerged as a satisfactory replacement for coke in the manufacture of iron.**

This new use for residual, which opens a vast new market to the oil industry, was demonstrated last week by W. R. Rombough, assistant to a superintendent at Dominion Foundries & Steel Co., Ltd., Hamilton, Ontario.

He spoke before a conference conducted by the American Institute of Mining, Metallurgical, & Petroleum Engineers in Philadelphia.

Working with Esso Research & Engineering Co., Dominion Foundries has discovered that:

- The oil handling and injection equipment used in the operation is not unduly complicated.
- Oil injection adds a new tool for the control of blast furnaces.
- Operating with 130 lbs. of oil per ton of iron, fuel oil with a 2.25% sulfur content had no significant effect on the sulfur content of hot metal.

•

**Socony Mobil Oil Co. is now marketing tetramethyl lead (TML) to motorists in the Rome and Naples markets of Italy, marking the 12th country in which it has introduced the additive.**

Tetramel, Socony's name for TML, is now available to motorists in Australia, Austria, Belgium, Italy, The Netherlands, South Africa, the United Kingdom, Venezuela, the three Scandinavian countries, and (on a test basis) in this country.

•

**Phillips Petroleum Co., starting this month, has agreed to accept Diners' Club credit cards at its service stations and marinas.**

The major oil company, which markets in 40 states, expects that soon nearly all of its 18,000 outlets will be participating in the agreement.

•

**Oil Heat Institute of Washington has launched a $30,000 advertising campaign to promote 270 new homes featuring oil heat equipment.**

Builders and realtors participating in the campaign have received from OHI a complete home-decorating kit for each home.

The campaign, concentrated mainly in Seattle, will be repeated next year if results are good.

R. L. Adams

F. T. O'Leary

**R. L. ADAMS** moves up to general manager of Continental Oil Co.'s western region, with headquarters in Los Angeles, and **F. T. O'LEARY** succeeds him as production manager for Conoco's CATC region, with offices in Houston. Adams succeeds **J. P. Malott,** who recently transferred to Houston as vice-president and general manager of production. O'Leary was formerly regional superintendent of natural gasoline and gas operations at Houston.

**R. C. EARLOUGHER,** Earlougher Engineering Co., Tulsa, has been elected district chairman of the American Petroleum Institute's Division of Production for the Mid-Continent district. He succeeds **John Albright,** Cities Service Petroleum Co., Bartlesville, Okla., who has been elected chairman of the district advisory committee. New vice-chairmen for the district include: **James Austin,** Austin Drilling Co., Seminole, Okla., for the Seminole area; **E. B. Krider,** National Cooperative Refinery Assn., Great Bend, Kan., Kansas area; **W. H. McPhail,** Tidewater Oil Co., Drumright, Okla., Drumright area; **Max A. Bolick,** Cities Service Petroleum Co., Pampa, Tex., Texas Panhandle area; **W. R. Cook,** independent, Duncan, Okla., southwestern Oklahoma area; **W. S. McCuen,** Samedan Oil Corp., Ardmore, Okla., Arbuckle area; **Homer Austin,** Phillips Petroleum Corp., Pauls Valley, Okla., Golden Trend area; and **Warren Richardson,** Cameron Oil Co., Oklahoma City, Oklahoma City area. **R. J. Hall,** Liberty Mfg. Co., Oklahoma City, has been elected Mid-Continent district secretary-treasurer.

**CITATIONS OF SERVICE** were presented to **Herbert M. Cooley,** Bethlehem Steel Co., **Fred V. Kluck,** Ohio Oil Co., and **H. A. Nedom,** Amerada Petroleum Corp., all of Tulsa, at the annual meeting, this month, of the Mid-Continent district of API's Division of Production. The three men were honored for their outstanding service to the Mid-Continent district.

**A. M. L. KUBE** has been promoted to Panhandle district superintendent for Phillips Petroleum Co.'s natural gasoline department at Borger Tex., succeeding **A. W. Paris,** who has retired. Kube, who has served as assistant district superintendent there since 1958, joined the company in 1942.

**GLENN W. POORMAN** has been elected executive vice-president of Esso Export Corp., New York, international marketing affiliate of Standard Oil Co. (N.J.). He succeeds **Robert H. Milbrath,** now president of Esso Export. Poorman, a director, was most recently vice-president of supply. At the same time, **M. A. Matheson** has been elected a director of Esso Export. He has been the company's senior Eastern Hemisphere advisor, in London, since 1958.

G. W. Poorman

W. J. Arnold

**W. JOSEPH ARNOLD** has been elected vice-president and comptroller of Pure Oil Co., Chicago. Arnold, who joined Pure in 1934, was named assistant vice-president for accounting in 1947, and took on added duties as comptroller in 1955.

**G. E. HINDS** has been promoted to director of market research and development in the petrochemicals department of Continental Oil Co., Houston. He was formerly director of marketing development. **C. E. Bethel, Jr.,** has been promoted to director of petrochemical market research, reporting to Hinds. He was formerly assistant director of petrochemical market research.

L. M. Ream, Jr.

P. E. Cundey

**LOUIS M. REAM, JR.** has been elected treasurer, and **PAUL E. CUNDEY** secretary, of Atlantic Refining Co., Philadelphia. They succeed the late **Charles J. Reller,** former treasurer and secretary. Cundey will also continue as assistant treasurer. Ream, who joined Atlantic in 1948, was appointed assistant to the vice-president and general manager of finance and accounting in 1958, and was named director of the company's planning and economics department in 1960. Cundey has been with the company since 1941; he was appointed manager of transportation accounting in 1951, and assistant treasurer in 1955.

**TOM FORGAN** is managing director of the newly formed Kuwait Shell Petroleum Development Co., Ltd. Forgan has been associated with the oil industry for the past 28 years, serving in South America, the West Indies, and the Middle East. Kuwait Shell plans to complete a seismic survey of its Kuwait concession by midyear, and to choose its first drilling location by the end of the year.

**ARTHUR A. DRAEGER** is the new manager of economic and marketing research for the Esso Division of Humble Oil & Refining Co., with offices in New York. He succeeds **Robert P. Ferguson,** who has transferred to the marketing coordination department for Humble's parent, Standard Oil Co. (N.J.). Draeger was most recently assistant manager of marketing for Esso's New York State area, with offices in Pelham. Before that, he was manager of the northeast area of the Humble Division's marketing department, with offices in Dallas.

A. A. Draeger

H. T. Cruikshank, Jr.

**HAROLD T. CRUIKSHANK, JR.,** has been appointed deputy marketing coordinator for Standard Oil Co. (N.J.), with offices in New York. He was most recently Jersey's marketing advisor for Europe, the Mediterranean area, and West Africa, and before that was manager of the company's marketing development division. **W. H. Johnson,** formerly assistant marketing advisor for France, Benelux, Austria, Germany, Switzerland, and Italy, will succeed Cruikshank. Before joining Jersey in 1959, Cruikshank had been with Esso Standard Oil Co., now a division of Jersey's subsidiary, Humble Oil & Refining Co., for 24 years.

**JOHN S. RUSSELL** moves up to manager of production of the Los Angeles exploration and producing division of Mobil Oil Co., effective May 1. He has been operations superintendent in the Midland (Tex.) division. Russell succeeds **R. O. Swayze,** who retires June 1. **John O. Hills,** currently division controller at Los Angeles, succeeds Russell.

**TED H. LOKEY,** Amarillo, has been named president of the Texas Oil Jobbers Assn., succeeding **J. K.Long,** Irving, Tex. New vice-presidents of the group are **T. A. Harrell,** Kingsville, and **W. J. Newell,** Alpine. **A. N. Rusche,** Houston, has been named secretary-treasurer.

**A. CLARK DAUGHERTY** moves up to vice-president of Republic Flow Meters Co., Chicago, a subsidiary of Rockwell Mfg. Co. Daugherty, who joined the parent company in 1946, became executive assistant to **W. F. Crawford**, president of Republic in 1957, when Rockwell acquired Republic.

A. C. Daugherty

W. N. Plamondon, Jr.

**W. N. PLAMONDON, JR.**, moves up to the newly created position of export sales manager for Continental-Emsco Co., with offices in New York. He will be responsible for coordinating all export policies, and assisting C-E's agents and representatives in various countries. **Robert V. Atkinson** succeeds him as drilling equipment sales engineer for the export division in New York. Atkinson was formerly sales and service representative for C-E's export division in Houston.

**WILLIAM C. BATES** is the new export salesman for Johnston Testers, Inc., with offices in Sugar Land, Tex. He will handle sales of Johnston testing and completion tools in North Africa, the Middle East, and Central and South America. Bates has been associated with Welex, division of Halliburton Co., and Lane Wells Co., one of the Dresser Industries, in South America, and with Houston Oil Field Material Co. in the U.S.

**J. A. ROWE, JR.**, has joined Magna Chemicals, Inc., as district manager, East Texas, with headquarters in Kilgore. He was formerly in charge of the production unit of Gulf Oil Corp.'s technical service department, with offices in Houston.

**M. E. MOHR**, vice-president of Thompson Ramo Wooldridge, Inc., Los Angeles, is general manager of its new electronic systems and equipment group, and **W. M. Jones**, also a vice-president, is associate general manager. The new group includes the operating divisions formerly included in the commerical electronics and intellectronics groups. Mohr has been general manager of intellectronics, and Jones has been general manager of commercial electronics. Headquarters for the new group will be in Canoga Park, Calif.

**J. P. NIELSEN** is the new manager of product sales for Axelson-Garrett, division of U.S. Industries, Inc., Houston. He will be responsible for sales of pump and sucker rod lines in the U.S. and Canada. **W. K. Woodward**, the new manager of sales administration, will supervise over-all material controls, sales engineering, and export sales, and **Neal V. Fowler**, who was promoted to manager of industrial sales, will be in charge of worldwide sales of relief valves, and government and special contract sales. **R. V. McAfee** was appointed manager of sales promotion and training, responsible for advertising and sales promotion, sales training, and market research and analysis. **J. T. Conner** continues as manager of product sales for gas lift, lease automation, wellhead safety systems, and other related product lines.

**JOE DONALD MARUSKA** has been promoted to manager of Mid-Continent Supply Co.'s store at Pincher Creek, Alberta. He was formerly field salesman for Mid-Continent at Pincher Creek. Maruska has been with the company in Canada since 1955.

**JACK WEIR** and **EDWARD J. KLEIN** are sales engineers at the new St. Louis office opened by the scientific and process instruments division of Beckman Instruments, Inc. Weir will be responsible for the sales of process instruments, and Klein for scientific instrument sales.

**DELWIN STULTS** has joined Harold Brown Co. as a salesman in the West Texas area, with offices in Midland. He was formerly an area engineer for Honolulu Oil Corp.

**GEORGE W. WHEELER** has been elected vice-president in charge of operations for Welstream Corp., Dallas, builder and operator of natural


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## PETROLEUM WEEK REPRESENTATIVES

Atlanta 9 — R. H. Powell
1375 Peachtree St., N.E.
Trinity 5-0523

Boston 16 — David G. Sawyer
Copley Square
Congress 2-1160

Chicago 11 — Edward A. Callahan Jr.
520 N. Michigan Avenue
Mohawk 4-5800

Cleveland 15 — Marcus A. Loy, Jr.
55 Public Square
Superior 1-7000

Dallas 1 — James R. Pierce
1712 Commerce Street
Riverside 7-9721

Denver 2 — J. W. Patten
Tower Bldg., 1700 Broadway
Alpine 5-2981

Detroit 26 — Merritt Hulburd
856 Penobscot Bldg.
Woodward 2-1793

Houston 25 — D. O. Hanson
724 Prudential Bldg.
Jackson 6-1281

Los Angeles 17 — Peter S. Carberry
1125 W. Sixth St.
Huntley 2-5450

New York 36 — David G. Sawyer
500 Fifth Ave.
Oxford 5-5959

Philadelphia 6 — H. Sherman Davis
6 Penn Center Plaza
Locust 8-4330

Pittsburgh 22 — Marcus A. Loy, Jr.
4 Gateway Center
Express 1-1314

Portland 4 — Scott Hubbard
Room 445, Pacific Bldg.
Capital 3-5118

San Francisco 11 — Peter S. Carberry
255 California St.
Douglas 2-4600

Tulsa 3 — J. A. Hartley
522 South Boston
Luther 7-5594

England, London E. C. — E. E. Schirmer
McGraw-Hill Publishing Co., Ltd.
34 Dover St.

Germany, Frankfurt/Main — S. Kimes
85 Westendstrasse

Switzerland, Geneva — M. R. Zeynel
2 Place du Port

gas compressor stations and processing plants. Wheeler was formerly vice-president of Gasoline Plant Construction Co., in Houston.

**ROBERT M. SMITH** has been appointed special representative for the Ideco Division of Dresser Industries, Inc., with offices at the division's headquarters in Dallas. His territory will be North America. Smith has been associated with petroleum industry sales for the past 20 years, specializing in drilling, workover, and servicing rigs and equipment.

R. M. Smith

R. C. Davidson

**ROBERT C. DAVIDSON** has been named technical director of the catalyst division of Nalco Chemical Co., Chicago. Davidson was formerly director of research at Harshaw Chemical Co., and has been associated with Richfield Oil Corp. and Filtrol Corp.

**THE NOMADS** National Board of Regents has selected the 1961 Houston Chapter Regents: **Ed W. Louden**, Baroid Division, National Lead Co., chairman; **John W. Gates**, Well Equipment Mfg. Co., treasurer; and **Basil H. Pickard**, Plastic Applicators, Inc., secretary.

**JACK H. ROMANS** and **ROBERT E. SIKES**, sales representative for the southern region of the National Supply Division of Armco Steel Corp., have been transferred to new locations. Romans moves from Lubbock, Tex., to Dallas, and Sikes from Dallas to San Antonio.

**JOHN A. BELL, JR.**, moves up to regional manager of Pipe Line Chemical Co.'s south-central Texas district, with headquarters in Austin, and **J. Timothy Roche** has been named as his assistant. Bell was formerly a sales representative for Pipe Line Chemical, and Roche recently joined the company. Pipe Line Chemical manufactures and distributes safety and maintenance chemicals for the oil and gas industry.

**N. S. KENDALL** has joined Smith Industries, Inc., Houston, as assistant to the president. He was formerly general manager and secretary of Jamar-Olmen Co., and has been associated with Platt Rogers, Inc., and Naess & Murphy.

**GEORGE E. BORST** and **EDWARD S. FRASER** have been elected directors of Chicago Bridge & Iron Co., Chicago. Borst is vice-president and manager of CB&I's eastern region, with headquarters in Philadelphia, and Fraser is CB&I's vice-president in charge of manufacturing, in Chicago. They succeed **H. C. Brown** and **Donald A. Leach**, who are retiring from the company. Borst, who joined CB&I in 1925, became a vice-president in 1956, and Fraser, with the company since 1939, was elected a vice-president in 1960.

**DR. GAYTON E. GERMANE** has been appointed director, transportation planning and research, for U.S. Steel Corp.'s traffic division at Pittsburgh. He was formerly professor of transportation and management at the Stanford University Graduate School of Business.

**F. T. TAYLOR** is manager of a new office and warehouse at McComb, Miss., recently opened by Baker Oil Tools, Inc. Taylor, who has been with Baker for the past ten years, was most recently a sales and service engineer at Odessa, Tex.

**TED C. SCHROEDER** has been appointed manager, industrial projects, for Union Switch & Signal, division of Westinghouse Air Brake Co., in Swissvale, Pa. He was formerly product manager, systems, in Union Switch & Signal's general apparatus department.

**PAUL R. NAGLE** is the new northeastern district manager for the W-K-M division of ACF Industries, Inc., with offices in New York. He will be responsible for sales of all lines of the division's valves, fittings, sealing compounds, and lubricants. Nagle was most recently associated with Andreason-Lundberg, W-K-M's export representative, and before that was export manager for Baash-Ross Tool Co., a division of Joy Mfg. Co.

W. B. Thomas

F. V. Walker

**F. V. WALKER** has been promoted to the newly created position of regional sales coordinator for the northern region of Security Engineering, division of Dresser Industries, with offices in Denver, and **WILLIAM B. THOMAS** succeeds him as West Texas division manager for Security, in Odessa. Walker will coordinate sales and service operations in the Rocky Mountain area. Thomas was formerly special sales representative for Security in Dallas. At the same time, **Mack Harlan** was named district manager, Odessa district, and **E. R. Beasley** was named division office manager, West Texas division, in Odessa. Harlan was formerly manager at Carmi, Ill., and Beasley was sales staff assistant at Security's headquarters in Dallas. **D. M. Harrell**, formerly manager of the Corpus Christi district, transfers to Oklahoma City in the same capacity.


## SEARCHLIGHT SECTION

(Classified Advertising)

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by Dr. R. R. Wheeler, Meadows Bldg., Dallas 6, Texas

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**Market Planning and Development—A new** staff function to help introduce profit concepts to your marketing organization—economic analyses, investment criteria, cost and distribution research, profit control systems, expansion studies, acquisition analysis, experimental marketing research —aggressive manager available, 9 yrs. major oil co., B. Chem. Eng., M.B.S., SS-6566, Petroleum Week.

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**P-6589 Petroleum Week**
**520 N. Michigan Ave., Chicago 11, Ill.**

# Oil Faces a Shortage of Brainpower

IF THE OIL INDUSTRY doesn't watch its step, it could run smack into the middle of a "drastic" shortage of capable exploration and production manpower in the near future. Not today or tomorrow, but possibly as early as next year or the year after. Two warnings to this nature have been sounded in recent weeks—one by Gage Lund, vice-president of Standard Oil Co. of California, and one by Dr. Carl Gatlin, chairman of the engineering department of the University of Texas.

Both cited declining undergraduate enrollments in earth sciences. Lund said enrollment had fallen to such a low level that shortages in the number of geologists, geological and petroleum engineers, and geophysicists coming out of schools is almost certain in the next year or two. In addition, he said, our manpower reserves are starting to migrate from us to other industries. Gatlin predicted that a "drastic shortage" of petroleum engineering graduates is developing and will become acute by 1962.

BEHIND THE PROBLEM are the pessimistic opinions as to the "dire straits" of the oil industry, based on the current excess productive capacity. In addition, recent personnel cutbacks by the industry are further aggravating the situation. And, Lund said, there's another sign we're in trouble—growing competition from the so-called "glamour" industries—missiles, electronics, and the like.

Lund summed up his recommendations by saying: "We have an unbeatable combination to offer employees, when we couple reasonable security for themselves and their families with broad opportunities for personal progress, in a business whose horizons spread far beyond the limits of our vision. This is the package we have to sell to our people which, evidently, we haven't been selling too well. We've got to start doing so, now."

LUND IS RIGHT. There must be recognition of the problem. The industry must convince others that its future is bright. And it must convince young people interested in the industry that oil offers as great an opportunity as other industries. To create and maintain the interest of qualified students, it can go one step further by offering scholarships, fellowships, summer employment, and other incentives.

# Are your costs too HIGH?

## These pipeliners are cutting costs – using SIE control systems

**DISPATCHERS CONSOLE used by Cherokee Pipe Line Company for automatic control of liquid line.**

SIEMARC Supervisory Systems provide automatic monitoring and remote control for many industrial operations and processes including the petroleum installation pictured. Measuring, data gathering, telemetering, logging, display, indicating and computing are all integrated in the system. Both solid-state and relay components are used as dictated by proper engineering design. Transistors and semiconductor diodes are utilized in all high-speed switching and logic circuits including encoders, decoders, analog-to-digital converters, deviation detectors and magnetic drum circuitry. Separate electric logging typewriters record data and alarms.

**POWER LEVEL CONTROLLER used by Shell Pipe Line Corp. Ozark System for maximum pumping station operating economy.**

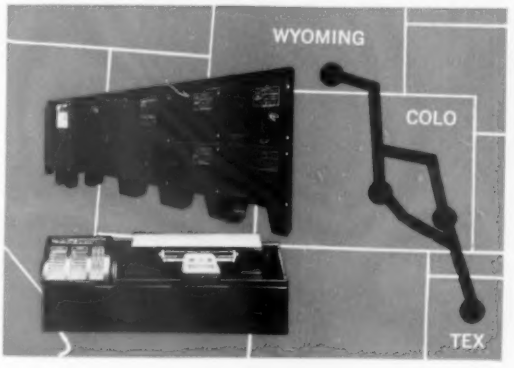
Completely unattended operation of a multi-unit pumping station is possible with Power Level Controllers used by Shell Pipe Line Corp. The unit accepts signals from flow and pressure pickups and makes logic decisions to bring proper combinations of pump units on or off stream automatically. It may be connected to the supervisory control system to permit reset of power levels from a central office dispatching console.

**COMPRESSOR STATION CONTROL CONSOLE including complete engine control equipment for automatic station operation and safety.**

For gas transmission automation, the basic SIEMARC system can be coupled with Log-Alarm Shutdown and Engine Control-Sequence units. Building block design throughout allows SIE to fit your needs exactly.

**DISPATCH PANEL used by Colorado Interstate Gas Company.**

In the Colorado Interstate Gas Company installation shown, dispatchers transmit only desired discharge pressure settings; automation at each compressor station responds by maintaining the selected value for optimum station economy. If communication links fail, local automation operates without interruption. Log-Alarm units insure station safety. Dispatchers are alerted only when trouble occurs.

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